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TRANSACTIONS

OF THE

CANADA MEDICAL ASSOCIATION.

TENTH ANNUAL MEETING,

MONTREAL, SEPT. 12TH AND 13TH, 1877.

VOL. 1.

Montreal:
PRINTED BY LOVELL PRINTING AND PUBLISHING COMPANY.
1877.

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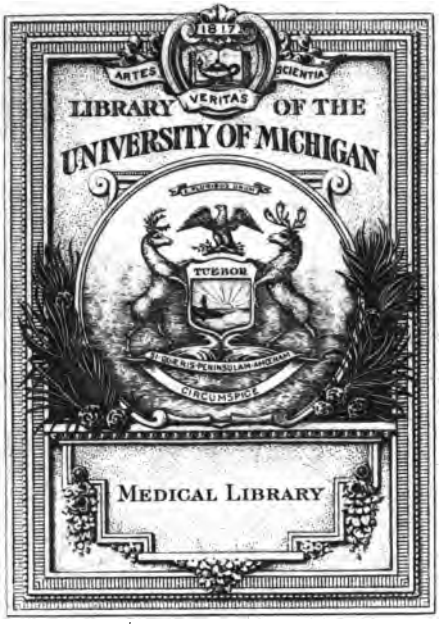

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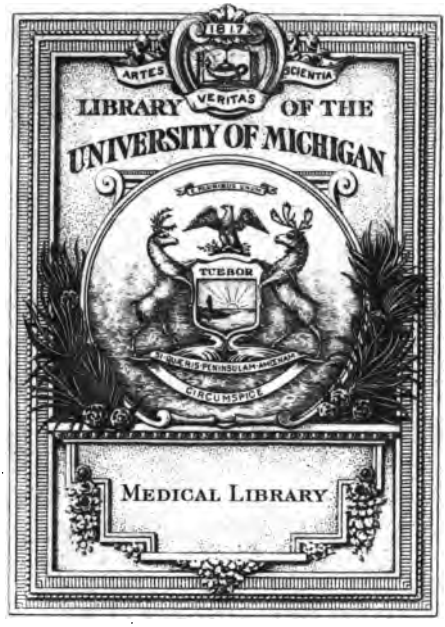

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TRANSACTIONS

OF THE

CANADA MEDICAL ASSOCIATION.

TENTH ANNUAL MEETING,

MONTREAL, SEPT. 12TH AND 13TH, 1877.

VOL. I.

Publication Committee:
DRS. DAVID, (*Chairman,*) E. ROBILLARD, R. P. HOWARD, F. W. CAMPBELL, AND OSLER, (*Secretary.*)

Montreal:
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1877.

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" 4 *for* A. J. McLaren *read* Lawrence McLaren.
" 16, Line 26, *for* defense *read* defence.
" 17, Line 10, *for* comunity *read* com nunity.
" 55, Line 25, *for* ☽ *read* ☽1.
" 74, Line 32, *for* anœmia *read* anæmia.
" 101, *for* Hornibrooke *read* Hornibrook.
" 113, Line 37, *for* circumfeernce *read* circumference.
" 163 and 234 *for* Pean *read* Péan,
" 176-184, in heading *for* Retina *read* Retinæ.
" 216 *for* seaton *read* seton.
" 221 Line 8, *for* marked *read* marked.
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1877-78.

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REPORT OF PROCEEDINGS.

FIRST DAY.

MONTREAL, 12*th September*, 1877.

THE tenth annual meeting of the CANADA MEDICAL ASSOCIATION was held this day in the Windsor Hotel, Montreal, when were present Drs. Hingston, President; Robillard, Treasurer; David, General Secretary; Osler, Parker, Botsford, Fenwick, Wilkins, Zimmerman, Canniff, Workman, Playter, Reed, Fulton, Sweetland, Grant, Russell (Quebec), Worthington, Atherton, Hornibrook, Bascom, Michaud, Gibson, Coleman, Mullin, Wheeler, G. W. Campbell, F. W. Campbell, Gardner, Buller, Trenholme, Chevalier, Schmidt, Ross (Montreal), Bell, LaRocque, Roddick, McCallum, Howard, Reddy, Reeve, and others.

The PRESIDENT opened the meeting at 10.30. The minutes of the last day's proceedings of last year's meeting, at Toronto, were read and confirmed.

On behalf of the Committee of Arrangements, Dr. OSLER reported the list of papers to be read, and that the credentials of Dr. Kimball, Lowell; Dr. Wing, Boston; and Dr. Brodie, Detroit, Delegates from the American Medical Association; Dr. Adams, Island Pond, Delegate from the Maine Medical Society; Drs. Ridley and Covernton, Hamilton Medical and Surgical Society, and Dr. Ecroyd, Union Medical Association of Wellington and Grey, were all correct.

The PRESIDENT welcomed the presence of these gentlemen at the meeting, and requested them to accept seats on the platform, as was also Dr. Workman and others.

The following gentlemen having been duly proposed and seconded, were severally elected permanent members:

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Dr. Charles Covernton, Simcoe; Dr. A. Proudfoot, Montreal; Dr. E. Berthelot, Montreal; Dr. L. O. Thayer, Montreal; Dr. Richard Macdonnell, Montreal; Dr. O. C. Edwards, Montreal; Dr. C. J. Morse, Montreal; Dr. R. A. Kennedy, Montreal; Dr. A. Alt, Toronto; Dr. Whiteford, Ottawa; Dr. J. B. McConnell, Montreal; Dr. George Armstrong, Montreal; Dr. W. F. Coleman, St. John, N.B.; Dr. R. Levi, Inverness; Dr. J. Perrigo, Montreal; Dr. J. L. Leprohon, Montreal; Dr. A. Johnson, Yorkville, Ont.; Dr. Molson, Montreal; Dr. Wm. McDonald, Montreal; Dr. J. W. Burgess, London, Ont.

On the motion of Dr. ROBILLARD, seconded by Dr. DAVID, Dr. Péan, surgeon in chief of the Paris Hospital (France), was elected an Honorary member.

Letters of regret at not being able to attend the meeting were read by the GENERAL SECRETARY from Dr. J. T. Steeves of St. John, N.B., and Dr. Daniel Clark of Toronto.

The GENERAL SECRETARY submitted a Report from Dr. Jennings of Halifax, on the climate of Nova Scotia, which was referred to the Committee on Climatology.

The President then delivered his address.

Dr. PARKER, seconded by Dr. G. W. CAMPBELL, moved a vote of thanks to the President for his able and comprehensive address, hoping it would not pass away without producing the good results intended. Dr. Parker hoped it would be published, or at least such portions of it as Dr. Hingston should deem desirable. This motion was carried by acclamation.

Dr. GEORGE ROSS, Chairman of the Committee on Medicine, read the report.

Dr. R. P. HOWARD, Chairman of the Committee on Medical Education and Literature, made report.

No reports were received from the Committees on Surgery, or Obstetrics.

It was then moved by Dr. R. P. HOWARD, seconded by Dr. GRANT: That the Association resolve itself into two sections, one of Medicine and one of Surgery, and that these sections meet at two o'clock on each day for the reading and discussion of the different papers, which motion was carried; and Dr. Parker was named Chairman of that of Medicine, with Dr. George Ross as Secretary; and Dr. Canniff, Chairman of that of Surgery, with Dr. McConnell as Secretary.

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Dr. GRANT moved, seconded by Dr. GIBSON, that the following members compose the Nominating Committee: Drs. Workman, Canniff, Fulton, Sweetland, Fenwick, Worthington, Osler, F. W. Campbell, Rottot, Parker and Botsford, which was carried and the meeting adjourned for an hour—lunch being served in the Hotel.

After adjournment Dr. WILKINS exhibited his beautiful and extensive apparatus on Practical Physiology and Histology.

Dr. RODDICK exhibited and explained a full and complete set of Lister's antiseptic apparatus.

A. H. DAVID, M.D.,
General Secretary.

The Sections opened at 2.15 p.m.

In the Medical Section Dr. R. P. HOWARD read a paper on TRICUSPID STENOSIS, which was discussed by Dr. Hornibrook, and others, and a vote of thanks, on the motion of Dr. WORTHINGTON, seconded by Dr. MICHAUD, was unanimously passed to Dr. Howard for his very learned and able paper.

Dr. FULTON read an interesting paper on the TREATMENT OF EMPYEMA, by tapping and the introduction of the drainage tube and the injection of tincture of iodine and carbolic acid.

An animated discussion followed, in which Drs. Parker, Howard, Fuller, Hornibrook and Ross took part. The thanks of the Section were cordially voted Dr. Fulton.

Dr. HORNIBROOK read a paper entitled PLEA OF INSANITY. Drs. Botsford, Workman and Mullin discussed Dr. Hornibrook's paper, and the result was that the subject was considered a matter for the Dominion Government.

A vote of thanks to Dr. Hornibrook was moved by Dr. BOTSFORD, seconded by Dr. WORKMAN, and unanimously carried.

On motion it was resolved that all the papers read in this Section this afternoon be referred to the Publication Committee as worthy of being published in the transactions of the Association.

The Section then adjourned.

GEORGE ROSS, M.D.,
Secretary.

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In the Surgical Section:

Dr. ALT read a paper on EPITHELIOMA OF THE EYE, which was discussed by Drs. Buller, Coleman and Proudfoot, and after a vote of thanks to Dr. Alt, the paper was recommended for publication by the Committee.

Dr. ROBILLARD next read a paper on GASTROTOMY and OVARIOTOMY, exhibiting and explaining a complete set of instruments used in these operations which he had brought out with him from Paris, and also a Thermo-Cauterre of Dr. Paquélon, for which a cordial vote of thanks was tendered to Dr. Robillard. Dr. Kimball of Lowell, made several observations on ovariotomy, and complimented Dr. Robillard on his lucid explanations of every step of the operation. Drs. Hingston, Thayer and Trenholme also spoke on the operation of ovariotomy.

Dr. REEVE read a paper on NASAL POLYPUS, which was ably discussed, and a vote of thanks passed to Dr. Reeve.

On motion the Section then adjourned.

J. B. MCCONNELL, M.D.,
Secretary.

SECOND DAY.

September 13*th*, 1877.

The following members being present: Drs. Hingston, Workman, Hornibrook, Sweetland, Canniff, Osler, Bessey, Thayer, Bascom, C. Covernton, T. S. Covernton, Reddy, LaRocque, Leprohon, Gardner, Parker, Fulton, Robillard, Fenwick, Proudfoot, Molson, Mullin, Gibson, Atherton, Worthington, Fuller, Zimmerman, G. W. Campbell, Howard, F. W. Campbell, Schmidt, David, Cline, W. McDonald, and others.

The President took the chair at 10.30.

The minutes of yesterday's meeting were read and confirmed.

Drs. Parker, Grant, Botsford, Brodie of Detroit, Adams of Island Pond, and Workman, were requested to take seats on the platform.

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The following gentlemen having been proposed and seconded were elected permanent members: Dr. Lamarche, Montreal; Dr. Park, Montreal; Dr. Bullen, Hamilton; Dr. A. B. Ward, Montreal.

On motion of Dr. FENWICK, seconded by Dr. ROBILLARD, Sir J. R. Cormack, of Paris, France, was elected an honorary member, and Dr. Botenturst, editor of the *France Médical*, elected a corresponding member of the Association.

Letters of regret at not being able to be present at this meeting were read from Hon. Dr. Ross, Quebec; Hannington, St. John, N.B., and Rosebrugh, Hamilton, the latter informing the Association that he would have the paper he had intended reading published, and a copy sent to each member of the Association.

The SECRETARY then read a letter from the Hamilton Medical and Surgical Society, kindly inviting the Association to hold its next year's Session in Hamilton.

Dr. WORKMAN called attention to accounts for the yearly subscription not being sent to members, as he knew some who paid for six years at last year's meeting, and would recommend that accounts be sent to every member yearly. This was considered right, and the Treasurer and General Secretary were requested to attend to it.

Dr. CANNIFF, seconded by Dr. LEPROHON, moved that this Association reiterates the opinion expressed at last year's meeting in Toronto, "That a committee be appointed to prepare a memorial to present to the Dominion Government, relating to the subjects of Vital Statistics and Public Hygiene," and that the following gentlemen compose this committee: Drs. Hodder, Hingston, Workman, D. Clarke, Playter and the mover and seconder, which motion was agreed to.

Dr. FULTON, as Chairman of the Committee on Therapeutics and New Medicines, then read the report.

Dr. THAYER, seconded by Dr. LAROCQUE, gave notice that he would move at the next meeting of the Association, "That application be made to the Local Governments to keep three or four heifers in a convenient place, for the purpose of supplying medical men with vaccine virus derived directly from the cow."

Dr. OSLER, as Chairman, laid the report of the Committee on Necrology on the table.

On motion, the report of the Nominating Committee was deferred until 4.30 p.m.

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Dr. BOTSFORD reported verbally for the Committee on Climatology.

The Right Hon. Lyon Playfair, C.B., &c., M.P. for the University of Edinburgh, having entered the room, was introduced to the meeting by the President, and requested to take a seat on the platform, and on the motion of Dr. Hingston, Dr. Playfair was by acclamation elected an Honorary member of the Association. Dr. Playfair made a graceful acknowledgment of the honor paid him.

Dr. Taylor, of Edinburgh, was also requested to take a seat on the platform.

Drs. PARKER, WORKMAN, BESSEY and GRANT spoke on the subject of Dr. Botsford's remarks about Vital Statistics, the latter stating he thought the Dominion Government would do all in its power.

Dr. WORKMAN read a paper on Crime and Insanity, which was to have been read in the Medical Section, yesterday, but by request was read in General Session.

Dr. MULLIN made a few observations, when it was moved by Dr. HORNIBROOK, seconded by Dr. PARKER, "That in the opinion of this Association it is desirable in all criminal trials when medical opinion suggests the possibility of mental unsoundness, the accused should be placed under the supervision of experts for a sufficient time to enable them to determine whether he was insane or not at the time the crime was committed."

Dr. PARKER earnestly supported this motion.

Dr. BRODIE, of Detroit, also addressed the meeting on the subject, and concluded by saying in his State, Michigan, capital punishment had been superseded by imprisonment for life.

Dr. F. W. CAMPBELL also spoke on the matter, when Dr. Hornibrook's motion was put to the meeting and carried unanimously.

Dr. R. P. HOWARD made a few observations on the question, and gave notice that he would move the following at the next meeting: "That it is in the interest of justice that when post mortem examinations are to be made, experts, familiar with such scientific work, should be employed by the Crown when procurable."

The meeting then adjourned.

A. H. DAVID, M.D.,
General Secretary.

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The sections met at 2 p. m., and at 4.30 p. m. the General Session resumed business, the President being in the chair.

The minutes of the morning's meeting were read and confirmed.

Dr. Lachapelle, of Montreal, was elected a permanent member.

Dr. PARKER, as Chairman of the Medical Section, reported that a paper on Addison's Disease had been read by Dr. George Ross, which was discussed by Drs. Parker, Zimmerman, Howard and Hornibrook.

A paper by Dr. Workman on the use of large doses of acetate of lead in *post partum* and other hemorrhages, which was followed by an interesting discussion in which Drs. Mullin, Howard, David, Reddy and others took part.

A case of Progressive Pernicious Anæmia by Drs. Bell and Osler, and Dr. Larocque began his paper on Vital Statistics, but was obliged to stop, owing to a message from the President asking the Section to join the general meeting. It was consequently resolved that the following papers be considered as read and handed to the Committee on Publication: Dr. Larocque, Vital Statistics; Dr. Playter, Economical Aspects of Public Sanitation; Dr. Proudfoot, Case of Supposed Gummy Tumour of Brain.

In the absence of Dr. Canniff, Chairman, Dr. MCCONNELL read the report of the Surgical Section.

Dr. TRENHOLME read a paper on Vesico-Vaginal Fistula, which was discussed by Drs. Hingston, Fenwick, Godfrey, Grant, and a vote of thanks was proposed and carried to Dr. Trenholme for his paper.

Dr. FENWICK next read a paper on Excision of the Knee, which was discussed by Drs. Grant, Atherton and Canniff, and a vote of thanks was cordially passed to Dr. Fenwick for his instructive paper.

Dr. BULLER then read a paper on Embolism of the Central Artery of the Retina, which on motion was referred to the Committee on Publication, with a vote of thanks to Dr. Buller for his very able paper.

As the time of the session was up, Dr. REEVES asked to lay his paper on Optical Defects on the table, and on motion it was referred to the Committee on Publication.

Dr. Canniff's paper, on Various Wounds and their Treatment, was also referred to the same Committee.

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Dr. REEVES placed before the Section a specimen of Epithelioma of the Eye with explanatory notes.

A vote of thanks was then passed to Dr. Canniff for the able manner in which he had conducted the business of the Section.

Dr. PARKER called the attention of the meeting to the number of valuable papers that had been offered at this meeting, which there was not time to read, and moved, seconded by Dr. WORKMAN, "That it be suggested to the Committee of Arrangements that for the future the session be of three days, if necessary," which motion was carried unanimously.

Dr. OSLER, on behalf of the Nominating Committee, reported the following gentlemen as the officers for the following year: Dr. Joseph Workman, of Toronto, as President; Dr. David, of Montreal, as General Secretary; Dr. Robillard, of Montreal, as Treasurer; Dr. McDonald, of Hamilton, as Vice-President for Ontario; Dr. Worthington of Sherbrooke, as Vice-President for Quebec; Dr. Cowie, of Halifax, as Vice-President for Nova Scotia; Dr. McLaren, of St. John, as Vice-President for New Brunswick; Dr. Sweetland, of Ottawa, as Local Secretary for Ontario; Dr. F. W. Campbell, of Montreal, as Local Secretary for Quebec; Dr. John Black, of Halifax, Local Secretary for Nova Scotia; Dr. Atherton, of Fredericton, Local Secretary for New Brunswick.

COMMITTEES.

Publication.—Dr. David, *Chairman;* Drs. Robillard, F. W. Campbell, Howard and Osler.

Medicine.—Drs. Mullin, Hamilton; Ross & Lamarche, Montreal.

Surgery.—Drs. Malloch, Hamilton; Grassett, Toronto; Farrell, Halifax.

Obstetrics.—Drs. Rosebrugh, Hamilton; U. Ogden, Toronto; Trenholme, Montreal.

Therapeutics.—Drs. Kennedy, Toronto; Kollmyer, Montreal; Woodhill, Halifax.

Necrology.—Drs. Riddell, Toronto; S. Lachapelle, Montreal; Burgess, London.

Medical Education and Literature.—Drs. Ridley, Hamilton; Michaud, Kamouraska; Howard, Montreal.

Climatology.—Drs. Playter, Toronto; Larocque, Montreal; Jennings, Halifax; E. Lachapelle, Montreal.

Committee of Arrangements.—Drs. McDonald, Ridley, Mullin, Malloch, Mackelcan.

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The following gentlemen having been proposed and seconded were duly elected permanent members: Dr. Cowie, of Halifax; Dr. Kollmyer, of Montreal.

The following gentlemen were appointed delegates to the American Medical Association:—

Drs. Botsford, Trenholme and Hornibrook, it being understood that if any other members wished to atttend, the President could add them to the list.

Dr. BELL gave notice that he would move at the next meeting to change or amend the By-Laws so that officers of the Association might be elected for each of the provinces of the Dominion, existing or then existing, such as Manitoba, British Columbia, &c.

The election of the officers for the current year was then proceeded with, and those recommended by the Nominating Committee were all unanimously elected.

Dr. OSLER called the attention of the meeting to the necessity of having the proceedings of the annual meetings published, and kindly offered to raise a subscription among the members for that purpose, as the funds of the Association were so small that it could not be done in any other way than by subscription.

Drs. Dugdale and Lamarche were named to examine the Treasurer's books and papers.

On motion, the same sum as last year was voted to the General Secretary for his services.

Dr. Wright not being present at the meeting, his notice of motion to alter the By-Laws was laid over.

The GENERAL SECRETARY then read a letter from the Hamilton Medical and Surgical Society, inviting the Association to hold its next annual meeting in the City of Hamilton, which invitation was cordially received, and on motion it was unanimously resolved, "That the meeting next year be held in the City of Hamilton."

Dr. PARKER moved, seconded by Dr. DAVID, "That the By-law on the time of meeting be suspended so that the meeting at Hamilton be held on the second Wednesday of September, 1878," which motion was unanimously carried.

Dr. MULLIN thanked the Association for having accepted the invitation of the Hamilton Medical Association, and assured the members they would receive a hearty and cordial welcome.

The following gentlemen were named as the Committee of

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Arrangements, with power to add to their number: Drs. McDonald, Ridley, Mullin, Malloch, Mackelcan.

It was moved by Dr. PARKER, seconded by Dr. F. W. CAMPBELL, that the thanks of the Association be given "To the Syndicate of the Windsor Hotel for the admirable facilities afforded the Association for its place of meeting, and for the readiness with which its co-operation was afforded," which motion was cordially agreed to.

On motion, a vote of thanks was also passed to the Grand Trunk Railway Co., the Intercolonial and the Great Western R. R. Cos., and to the Richelieu and Ontario Navigation Company for their kindness in granting reduced rates of fare to members.

Drs. DUGDALE and LAMARCHE reported having carefully examined the Treasurer's books and papers, and found all correct. The amount received for the past year being $221.33; amount expended, $195.68, leaving a balance in hand of $25.65.

Dr. REEVE, seconded by Dr. ZIMMERMAN, then moved a vote of thanks to the members of the profession in Montreal for their courtesy and hospitality to the members from other places, which motion was carried by acclamation.

Dr. BELL moved a vote of thanks to the Committee of Arrangements for their great labours and the perfect success of them, which was also carried by acclamation.

On the motion of Dr. ZIMMERMAN, seconded by Dr. MULLIN, the President vacated the chair, and Dr. Workman was requested to take it, when Dr. ZIMMERMAN moved, seconded by Dr. MULLIN, "That the sincere feelings of the Association be tendered Dr. Hingston for his affable and courteous bearing while presiding, which calls for our most sincere thanks."

A cordial vote of thanks was passed to Drs. Brodie, Kimball, Wing and Adams, for the honour they had done the Association in being present throughout the Session. Dr. Brodie, of Detroit, returned thanks in a few well-chosen words.

A cordial vote of thanks was also passed to Drs. Wilkins and Roddick for having displayed their valuable and interesting apparatus.

The Session then adjourned.

A. H. DAVID, M.D.,
General Secretary.

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ADDRESS BY THE PRESIDENT,

WM. H. HINGSTON, M.D., L.R.C.S.E., D.C.L., F L.A.

GENTLEMEN,—In taking possession of this chair, the first duty (as well as the highest pleasure) is to express to you my profound gratitude for the honour you have conferred upon me in calling me to occupy it. Permit me to assure you that I am fully sensible of that honour, and that I realize, at the same time, the important duties your partiality has imposed; and, believe me, if I fail to discharge them to your, or to my own satisfaction, it will not be for want of good will on my part. My predecessors in this chair,—chosen for their fitness, at different times, from various parts of the Dominion,—have consigned to me the continuation of a labour begun ten years ago in the ancient city of Quebec, for the advancement of that benevolent profession with which we are so closely united or related. Although much has already been accomplished, we must admit that *all* the advantages hoped for from its founders have not yet been realized. Sufficient has been effected, however, to satisfy them and us, that a greater degree of energy on the part of the members of this Association, pervading, adjusting, sustaining, and agitating the whole, would have been attended with a greater measure of success. But in a profession such as is ours, ever varying, ever undergoing mutation of some kind; endeavouring to eliminate what can no longer be productive of good; and to appropriate what it wishes to retain; and with difficulties arising from geographical and social conditions, the Association has, indeed, effected some good since its formation.

It has been the custom, for some time past, at the opening addresses before societies of this nature in Europe, and chiefly in Great Britain, to take up some department of the healing art, or some master or explorer who has passed away. Thus Paget advocates, at length, before the Surgical Society, the claims of Hunter as a physiologist; Sieveking vindicates anew the claims of Harvey to be considered the discoverer of the circulation of the blood. But at the annual meetings of this Association, where time is not afforded for abstract questions of historic interest, we are confined to those of practical moment—those politico-medical questions, chiefly, which concern us most.

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OBJECTS.

It is sometimes insinuated that this Association has no objects sufficient for its existence; and that the good effected is altogether disproportionate to the labour, expense and time of coming together. But those are the insinuations of the ill-informed, who fail to perceive that, apart altogether from the scientific importance of such gatherings, the social advantages of union and converse, social sympathy and fellowship with each other, outweigh, immeasurably, the inconveniences. The Medical Association of our American cousins has had its history, but now it numbers so many members that it seriously contemplates making some change whereby that number may be reduced. Although almost too large and unwieldy for practical purposes, were it to pass away now, after only 30 years of existence, it must be admitted to have effected an amount of good that could not have been obtained in any other way. It has brought the medical profession of the United States into one body, and has encouraged State and smaller local societies, thereby improving the tone in these. So also with this Association, which can boast an existence of only one-third that period. Legislation has endeavoured to impose geographical boundaries; this Association defies all efforts at fixing limits or bounds, as of a territory. Legislation has imposed a term and limit to our functions, making the fit and capable practitioner of one province of our country disqualified for the duties of his calling in another; this Association rubs out and obliterates, for the time being at least, those unsightly enclosures which, although in a measure necessary, and created in self-defense, yet mar the beauty and unity of the whole.

DIVISION OF LABOUR.

It is a matter of gratification that the work this session will, for the first time, require to be divided into sections. Hitherto every thing has been done in general assembly, but the number of papers this session is so many that two sections, at least, require to be created; and I shall ask you at the proper time to suspend the By-Laws so that sections may be formed, one for medicine, and another for surgery. The other branches of the healing art must needs find place in one or other section.

The general sessions will be held in the morning, each day, at which the reports of the various committees will be read. The

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papers on special subjects will be read and discussed at the afternoon sessions of the sections to which they may be referred.

As the work of the Association will be divided into sections, I am precluded the opportunity of dealing with what will be brought forward by the chairmen of sections at the proper time. I shall therefore touch upon questions of general interest, which cannot come under the prescribed heads; yet which concern the well-being of this Association; of the learned profession which it represents; and, more than all, of the comunity in which it is fostered.

MEDICAL LEGISLATION.

The acts relating to the profession of medicine and surgery, in existence for many years past, in this Province, have been changed. If amendment means improvement, correction, change for the better, then have I difficulty in unreservedly qualifying the hasty legislation in the ancient capital, last session, where three bills went in, to satisfy the fancies of three orders of mind, and one came out, satisfying fully, I believe, no order of mind.

The Province of Ontario has a central examining board, and the medical press and profession of that Province have pronounced in its favour. The Province of Quebec has, as yet, no central board, yet nothing short of it will satisfy the wishes of those who look only to the well-being of the profession, and of the community.

Medical education, as well as the preparation for it, belongs to each Province. It is useless, therefore, to speak of medical legislation for the whole Dominion; or of having a medical act to apply to, and to govern, the whole Dominion. But it should be an easy matter to introduce measures simultaneously, in the several Local Legislatures, each for its own Province, yet all alike, so that the practitioner in one part of the Dominion could be a practitioner in all; but central examining boards, one for each Province, and an uniform standard for the whole, must be elements in that system.

To compel persons, having a *license* to practise in one part of the Dominion, to obtain another to practise in another part of the same Dominion, seems to be an anomaly, but an anomaly which can be remedied only by a parity of medical legislation in the several Provinces.

How much more liberal is the present action in Great Britain, where the English College of Physicians has passed a by-law, by which even foreign practitioners may be legalized in England.

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Any candidate for the College license "who shall have obtained a degree in medicine or surgery at a British, Colonial, or Foreign University, recognized by the College, after a course of study, and an examination satisfactory to the College, shall be exempt from re-examination on such subjects as shall in each case be considered as necessary."

In this way, foreign and colonial practitioners may join the English College of Physicians, and so "find entrance to the Regis ter"—the Medical Council of Great Britain still retaining the duty of accepting the conditions for admission to the Register of foreign graduates. It appears to me to be the duty, as well as the interest of this Association, to endeavour to effect such changes as would lead to a like generous action.

In our recent act, some most serious defects occur which, it is to be hoped, may soon be remedied. As the law now stands, it is competent for one or two persons in the large cities, not over scrupulous as to means, so to gather up and manipulate proxies as to change the composition of the Board at an election. One active man in Quebec or Montreal may control matters at any time for the whole Province, and practitioners residing in the town, or in country districts, may, without their knowledge or consent, be made instruments for the purpose. In Ontario, it is different. There, each medical school has *one* in the Council of the College of Physicians and Surgeons, not *two* as here; and those outside the teaching bodies must not only be residents of the several territorial divisions for which they are elected, but "one shall be so elected from each of the territorial divisions by the registered practitioners of Medicine *resident in such division.*" And the divisions are those "as established previous to the Confederation of the British American Provinces for election of members of the Legislative Council of the late Province of Canada." With us each member of the College of Physicians and Surgeons, the moment he enters the profession has 40 votes for election purposes! He may use one in favour of the representative of his district or division, and still have 39 votes remaining for those outside of it; and may either vote, or transfer them to the most clamorous. It may be readily understood how such a defect in a law might lead to unseemly cabals, if not to confusion and injustice. It is to be hoped the anomaly that exists in our election procedure in this Province,—an anomaly for which I can find no parallel elsewhere,—will be removed.

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QUALIFICATIONS FOR PASSENGER SERVICE.

Through the medical press of this country, attention has been drawn to the refusal to recognize Canadian qualifications for emigrant and passenger service on board British ships; and the matter has been taken up by the Transatlantic Medical Press and the Medical Council of Great Britain. The Board of Trade has rescinded the order, and Canadian Surgeons continue to exercise the privileges they have enjoyed, since emigrants first came to our shores. But the law still exists, and it is competent for the British authorities to return, at any time, to their former action. The qualifications of holders of Canadian diplomas have not yet been recognized, but their continued employment is acquiesced in. Many have asked that the subject be settled definitely. How can *we* ask for it till we obtain for the holders of Canadian diplomas recognition all over our own Dominion? Can we ask Great Britain to concede to us what we do not concede to each other? I say this, not to interfere with the courteous and most generous action on the part of the British authorities, but to stimulate you to renewed efforts to make such satisfactory arrangements as will enable holders of diplomas from one part of the Dominion to practice in all. The profession of medicine is a liberal one; not mean, narrow, or selfish. Being liberal, although somewhat foreign to the subject, I cannot but allude to the uncourteousness of a member of the profession in Ontario towards a surgeon of distinction in Detroit who visited Ontario to perform an operation at the request of a highly respectable physician of the place. I am sure you will willingly make me the interpreter of your views in assuring Dr. Jenks, and, through him, the members of the profession in the adjoining Union, of our honest offered courtesy, and of our continued desire for reciprocation in matters which even governments cannot, and should not, attempt to control. Science requires, and humanity demands, in matters of this kind, the most unfettered complaisance and civility.

EDUCATION.

I am naturally drawn from a consideration of the question: What should constitute the qualifications of a medical student before entering upon the *practice* of his profession, to what should be his qualifications on entering our medical schools? Should he have secured knowledge which promised nothing beyond know-

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ledge itself; or, should he, as would have done a Cato, have acquired knowledge with reference only to what it could produce? Should he possess a liberal education; or that sort of knowledge which we now term useful? Should he possess refinement and enlargement of mind; or only sufficient knowledge of Latin to translate Gregory or the Pharmacopœia? Should he possess liberal knowledge, or, as it has been happily termed, a gentleman's knowledge—which, to possess it, is something, though it produce nothing;—or that utilitarian knowledge which is of use only when acted upon? Should it be the education which is philosophical, which rises to, and is enriched with, ideas; or servile and mechanical, and which expends itself upon what is external and visible? Should it be the education which gives a high tone of thought, a high standard of judgment; or that education which merely makes of the memory a passive receptacle of scraps and fragments of knowledge, to be served out confusedly and without method. The education I vindicate should give cultivation to the intellect; it should give a delicate taste, a candid, equitable, dispassionate mind, a noble and courteous bearing in the conduct of life. It should open the mind, correct it and refine it, and enable it to "know and to digest, master, rule, and use its knowledge, and give it power over its own faculties, application, flexibility, method, critical exactness, sagacity, resource, address." With the intellect, thus tutored and instructed, the student might enter upon the study of that most difficult profession of which we are members; engage in a calling the due discharge of which requires all the attributes of the mind, and the highest culture of the intellect; and pursue with advantage a particular course of study which might issue in some definite, and, perhaps, remunerative work. It may be gathered from this that I share not with those arch levellers who advocate a low Utilitarianism; but rather with those who think the student should be formed "not by a parsimonious admeasurement of studies to some definite future object; but by taking a wide and liberal compass, and thinking a great deal on many subjects, with no better end in view, perhaps, than because the exercise is one which makes him a more rational and intelligent being." But this is not what has been obtained for us recently in a hurriedly prepared law relating to our profession in an important province of this Dominion, where our colleges and seminaries of learning have been degraded from their position. The graduate in arts, the student who has completed his eight or nine years curriculum at any of our colleges, should, by that fact

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alone, be qualified to enter upon the study of medicine. But no! our universities may grant degrees in arts, but the colleges and affiliate medical schools over-ride them!! and subject the candidate to a new ordeal, from which he should be exempt!!

Yet the possessor of a *liberal* education, compared with one *crammed* for an examination—the nature and extent of which he may have learned from those who had gone in before him—is, to use a familiar comparison, as one standing on the timber to be divided, seeing the line to be followed, and guiding the instrument intelligently, compared with the one beneath, who mechanically aids the work, but, blinded by the dust and particles he has detached above his head, is uninformed as to the progress or nature of the work being done. And so it is with labour of an intellectual kind. We must be above our knowledge, not under it. If above it, we may generalize, reduce to method, "have a grasp of principles and shape our acquisitions by them." If below our knowledge, we are confused and oppressed; and the greater the number of facts the more those facts confuse and oppress.* This is markedly the case in medicine. An ill-informed physician is easily startled at every change in the condition of a patient; and rushes in to check, control and interfere, when, with a better trained mind, he would be led to observe, and to note, that, if need be, he might, with greater advantage, guide and direct. The uneducated man, unaccustomed to group and to combine, gives prominence to what may be unimportant; and fails to recognize what is of value. It is with medicine as with politics. We have two classes of politicians in this country; the one, versed in the science and art of government, and in the ethics which concern human actions, and capable of an abstract view of the contentions of parties; the other, a mere transcript or copy of the last editorial in the journal of his party,—unequal to methodically arranging or digesting facts, or to comprehending the laws and principles which govern party and party issues. To which class of mind—

* In an able editorial in the Philadelphia *Medical Times* for May, 1877, it is asserted that the standard of graduation in the United States, south of New England, has been steadily lowered, and although "new matter has been added to the curricula," and "the bait of clinical instruction has been alluringly spread, the effect has been evil, because the attempt has been simply to pour into vessels already overfull." Would it not have been nearer the truth to say the vessels had not been prepared of a capacity to contain what they received, but could not retain?

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apart altogether from party—would you most willingly entrust the guidance of the concerns of state? I anticipate your answer. To which, in like manner, should be entrusted, not party issues, nor the interests of a party, but what is of far greater moment, —the health and life of the people,—but to intellects formed and disciplined for the perception of those phenomena, the causes of which, even to the best trained minds, are far from obvious or indubitable?

I have ventured to say this much, even at the risk of fatiguing you, in favour of a liberal education, for the time is come when physicians can no longer hope to retain their position in society without that perfection of the intellect which is the result of education; which, as Newman says, "is the clear, calm, accurate vision and comprehension of all things, as far as the finite mind can embrace them, each in its place, and with its own characteristics upon it." In the days of Samuel Johnson the physician was admitted to be the most cultivated and learned in any society. In how many countries in the world could that be said with truth to-day? Could it in Canada? There are some countries where the physician is still among the best educated gentlemen, and his social status is regulated accordingly. Notably is this the case in Ireland. Dr. Stokes, with whom I conversed on this subject in 1867, and to whom I remarked the high tone; the gentlemanly bearing; the friendly relation one to another; the easy, well-bred familiarity which characterized the members of the profession in Dublin, said: "It is easily explained; nearly all our graduates in medicine are graduates in Arts. Of the last 98 all had degrees in Arts." There are some other countries where the same condition obtains.

If the cultivation of the intellect was necessary when men were content to observe, and to base practice on observation, how much more necessary is it now, when the most acute logical minds are sorely puzzled between what are claimed to be scientific truths, and what are bold reckless assumptions.

SCIENTIFIC ASSUMPTION.

This is unquestionably the age of bold, reckless, I had almost said impudent, assumption in matters of science. While it is generally conceded that our "ideas of the intrinsic elements that constitute beings in the physical as well as in the moral order are very limited and imperfect," we now boldly assume the mutual

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dependence of things upon each other when we could logically establish nothing more than co-existence or succession; as if co-existence or succession necessarily implies connection or relation.* Look at the writings of a Spencer and a Huxley for illustrations of what I state. They, with Tyndall, have occupied a larger share of our thoughts than have many hundred more scientific writers who preceded and accompanied them. Yet what but bold assumption and word painting have we gleaned from the first of these; and a plausible but illogical mode of drawing conclusions.

SYNTHESIS IN MEDICINE.

While medical writers during the past and early part of the present centuries analysed, divided and separated diseases, and gave prominence to qualities and features by which one disease differs from, and is distinguished from another, (thereby clogging and oppressing the memory with varieties of dissimilitude,) there is a tendency now to synthetize, arrange and group in a more general way, diseases which may present some features of variance, but many of similarity and resemblance. Markedly is this the case in Cutaneous Medicine. Just one century ago, Shenck, of Vienna, completed his arrangement of cutaneous disorders. Willan wrote some twenty years later; and Hebra, also of Vienna, a half century still later. Compare the earlier with the later Vienna school, and we shall see that diseases are now classified on a sounder pathological and anatomical basis; that the skin is identified with "the rest of the organism;" and that the study of its diseases is clothed with a more scientific and philosophical

* We have had those assumptions on a large scale in Tyndall's assertion, recently, that the blue of the sky, as seen from the highest elevations, and above possibility of contamination with earth, is caused by vast numbers of foreign bodies floating in the atmosphere, so small as to be undistinguishable by a microscope magnifying 1500 diameters. Dollinger produced a magnifying power ten times that asked for, and *assumed* to be sufficient, but the minute germs still declined to exhibit themselves even to this powerful observer.

We have had the same thing on a small scale in our midst. We had in Canada predictions about the weather *many months in advance*, which were received by the thinking public with a smile of incredulity; but by the curious with avidity.—*dulce est errorari*. Had these been confined to foretelling the occurrence of the seasons, promising us much cold in winter, much heat in summer, many showers in spring time, and frost and falling leaves in autumn, we should have applauded so wise a reticence. But more definite prognostications were required by the public, and were given; still the heat came and went—and the "*froid vidait son sac*," with a wantonness and nonchalance regardless of the feelings and interest of Mr. Vennor.

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character. And what are the advantages resulting therefrom? Cutaneous affections are regarded less as local affections, than as local manifestations of a general disturbance. Our own Erasmus Wilson simplifies cutaneous disorders still more by placing them in four groups—an *assimilative* group; a *nutritive* group; a *neurotic* group; and a *specific*, of which syphilis is the only example. "Nearly every new disease of the skin," says he, "might be comprised, therapeutically, under these four heads." What a stride is here made in a most interesting branch of medicine! and yet only in conformity with the experience of every thoughtful and observant practitioner. The tyro in medicine has, or thinks he has, a half dozen remedies for every disease; but as experience is gained, he learns, and with advantage to his patients, to make a fewer number of remedies to suit a much greater number of disorders. And thus it is in surgery; and thus it will be in Gynæcology, when the process of resolving the more hidden operations of nature shall have had its limits somewhat defined.

I have always thought, and the belief has strengthened with observation, that the work of grouping diseases for therapeutic purposes is yet to be done. Sir Henry Holland, many years ago, partially guided the current of medical thought in that direction. But the tendency to analysis, which the study of minute anatomy, and the use of the microscope, so greatly favoured, diverted that current, till the observations of a Neumann, of an Auspitz, or of an Erasmus Wilson, showed, in one department of medicine, at least, what might, with great advantage, be accomplished in all. Perhaps some member of this Association may yet achieve in other departments of the healing art what has been so well effected in this.

STATE MEDICINE.

Without taking from the important useful advances in medicine; the splendid triumphs of the surgeon; the wonderful precision of diagnosis of the modern gynæcologist;—there is a department as important as any of these; yet one so recent, that it is only within the past few years it has found a distinct place in any of the medical schools of the Dominion. I allude to State Medicine. Its object is, as tersely stated by J. Marion Sims, "to do everything necessary to protect the health of communities and states. It investigates the air we breathe, the water we drink, the food we eat, the clothes we wear, the fuel we burn, the houses we live

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in, the soil we cultivate, the habits and industries of life, the origin and nature of endemics and epidemics, the methods of their transmission, and the means of their prevention, and of their suppression wherever found *** it endeavours to discover the causes, and to prevent the originating of disease; to prevent its egress, to circumvent it, to extinguish it, whether it be zymotic, contagious or specific. In short, it is the function of State Medicine to protect the public health, which is the life of the nation."

Gentlemen,—Is there, can there be, a more important work than "to protect the public health, which is the life of the nation?" And to whom does this work of right belong but to those who, already familiar with Physiological and Pathological Sciences can best teach and instruct their application "to the maintenance of the health and life of communities, by the means of agencies which are in common and constant use."

Speaking, as I do to-day, to, and in behalf of the Medical Profession, in this our beautiful and beloved Canada, I should say there is no work more important; no work more philanthropic; no work more benevolent than that of awakening in our population, and through it in Governments and Municipal bodies, a knowledge of, and an interest in, all matters relating to public health. A knowledge of the laws of health should not be confined to the profession. They were openly taught to the people by a Moses, and were not strained through time, but came down to our own day monuments of wisdom.

What is the duty and office of the physician? To deal with abnormal functions, and to change, if possible, or to remove unhealthy structures in the human body; to restore to that thinking faculty in man its pristine powers, that it may receive impressions, understand them, and be affected by, or be mindful of them; to restore health to the sick and wounded in spirit? Such, in a word, is the office of one who professes, or practises, the healing art; or who adopts manual operations for the cure of diseases that are external. But something more is required.

Is it not true that the profession as a body, deals chiefly, if not solely, with that entity when its being or existence is threatened; or when the harmony of its complex movements is disturbed? What a huge share of attention is directed to, and how closely we watch the progress in, that science which seems to deal chiefly with the symptoms of diseases, that we may recognize them truly; and with the effects of diseases, that we may limit or modify, if not

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hinder those effects. The medical press comes to us from every part of the civilized globe, and almost daily from around us, teeming with new methods of curing disease. New remedies, or new ways of employing old remedies, follow each other, phantasmagoria like, in such rapid succession, as to baffle the efforts of the most diligent experimentalist to examine and to select for future use, without seeming arbitrariness. And yet how often are the best efforts of the physician, even with his ever new and powerful armamentaria, powerless to check the spread of diseases, through the carelessness or ignorance of those who surround the sick bed! If, for instance, diseases consist, as claimed by Tyndall, of definite particles, sometimes floating in gas, or in the air, or in the liquid we drink; and that like organic seeds in the soil the particles multiply themselves indefinitely in suitable media —the great probability being that their disease producing qualities are living things—not gaseous or liquid,—but solid, the treatment of disease will resolve itself, sooner or later into a kind of germicide within and without the body—within, in the fluids and secretions of the body—without, in the noxious elements that surround it.

The conviction is steadily gaining ground that a Board of Health should be established for the Dominion; Provincial boards for each Province; and local boards for every municipality. But where shall we commence? With the Legislature? No! Legislators are but the mouthpieces of the people; and if party politics consume their time, they but act up to the standard by which the measure and quality of their work are to be valued. Give them, however, another, and a higher standard by which to estimate and measure the line of duty, and make them to understand that the health and happiness of a people, as Earl Beaconfield observes, are the foundation on which depend much of the happiness and power in the State, and we will find them exercising all the ingenuity of the age, and all the knowledge of our most advanced Scientists and Sanitarians in securing the lives, and in protecting the health of the people. But can we reproach them for doing nothing, while we do so little towards disseminating correct information, and inculcating proper habits among ourselves? Let us do our share outside of what is the truly professional—for none so qualified as we to do—and salutary laws will be framed, and the people will observe them. It is said that our favoured Sister City, the Queen of the West, and the Capital of Ontario, has made

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"several very vigourous and very unavailing attempts to form a Sanitary Association, with a view of aiding the authorities in improving the health of the city." This city has been more fortunate, and has done more—but it required to do more.

LEGISLATION ON HEALTH MATTERS

has been, so far, unformed, unfinished, and immature. When I entered officially, a couple of years ago, upon the labour of endeavouring to improve the sanitary condition of the city in which we are now met, I found no law that could be put into force to carry out the most necessary sanitary measures; and, in my earlier enthusiasm, struggled, with but partial success, to obtain some amelioration in sanitary legislation. More matured experience, however, apprised me that legislation is useless where the people are totally uninformed on the most elementary health matters. Where, for instance, the wisdom of endeavouring to enforce sewer ventilation, where the chief magistrate seriously proposed "trapping the sewers?" Where the advantage of endeavouring to accomplish what the whole scientific world approves of—general vaccination, —and, in times of epidemic, re-vaccination, when professors in medical schools will, in public squares and market places, harangue the uninformed against the practice? No. While our laws, as I have already said, are unformed, unfinished and immature, we, gentlemen, you, and I, and every one of us, have to do more than we have hitherto done to get those, whom sanitary laws affect, to have some sort of intelligent appreciation of the principles they involve. Every man can see, says Miss Lankerton, that if he persists in walking over a precipice he will, in all probability, be killed, and there is no need to enforce a law to prevent his doing so; but he does not see as clearly that if he and his family live and sleep in an atmosphere filled with sewer gas; or if they drink the unfiltered water of some dirty pool or river, destruction is as certain and inevitable, though by a slower process. Is it not clearly, then, the duty of those, whose eyes are open to the latter dangers, to make them evident, if possible, to those whose ignorance is as a "mist before their vision?" And, gentlemen, upon whom does that duty devolve, if not upon those who are qualified to instruct, where instruction is so much needed? I shall not go to other countries, or to other cities outside of our Dominion to ask a question. There are in Canada nearly 6000 physicians. Were that body of educated men to do its duty, each member of

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it in the space or circuit through which he walks, would the profound ignorance we meet with in sanitary matters be so general? I think not; and if accountability rests upon any one, upon us must fall a portion of that huge responsibility which doubtless rests somewhere for that large death rate which obtains in some of our larger cities. The physician who is content to prescribe only to those who are sick, but imperfectly discharges his duty to the state. There is a duty he owes to human society as such; to the state to which he belongs; to the sphere in which he moves (and the physician moves in every sphere); to the individuals towards whom he is variously related; and that duty is but ill-performed where ignorance the most crass, and prejudices the most benighted, are permitted to pervade a community.

INSANITY.

Papers will be read before you to-morrow, on this most important subject, showing, I have no doubt, to what a labyrinth of difficulties the physician is sometimes introduced, when dealing, or attempting to deal, with those questions of insanity, or supposed insanity, upon the elucidation of which, the hope and prospects of whole families sometimes depend. Whether, as held by certain Neurologists, hallucinations are accompanied, if not caused by, derangements of the optic thalamus or parts adjoining; or, according to others, that the seat of trouble is in the corpora quadrigemina; or, according to a third, that there is pigmentation of the retina and pigmentation of the spleen or of the cortical nerve cells, or in certain cases pigmentation of the whole brain; or whether, according to a fourth, better informed methinks, these appearances are mere coincidences, met with in sane and insane alike, thus severing the connexion endeavoured to be set up between insanity and pigmentation any where; or, whether anomalies in the vascular supply alone awaken old impressions, which are often erroneous, because misplaced as to time and circumstance; or whether, as beautifully put by Spitzka, complex registrations imply a higher consciousness, and can only have their seat in the higher centres, namely in the cortex cerebri, and that it is through the fasciculus of the corona radiata that registrations of thoughts or impressions, sane or insane, are "projected on the cortical convoluted screen," a screen, as Spitzka calls it, because it acts like one in receiving impressions, and differs from it only in that its impressions are never blotted out, except by

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destructive lesions or by death." While these questions concerning the site and causes of insanity are undergoing inquiry, and no where with more diligence than in some parts of America, let us hope with solution, the questions, why should the brain alienate its functions; in what manner is lunacy brought about; whence and from what source is reason dethroned; and where is the seat of the usurper, although pregnant with scientific interest, have a more practical aspect, and one which concerns the public not less, and justice and humanity more.

The responsibility or irresponsibility of accused persons is a not uncommon question to be decided in our Courts of Justice, where the plea of unsoundness of mind is often put forward to influence and guide, or to hinder and traverse, the due course of law. There are many phases of insanity indistinguishable to the unprofessional observer; and as, on the one hand, the legal definition of insanity was settled, established, and freed, as was supposed, from ambiguity, by Legists who have long since passed away; on the other, every year adds a something to our etiology and pathology of that state, which under the term *insanity*, includes so many varieties of unsoundness of mind. The breach between Medicine and Law on this question has always existed, and must necessarily grow wider and wider, until another Erskine shall have arisen, who, availing himself of the researches of recent neurologists, will adopt a definition more nearly correct than any of those which I take at random from standard works: "Un délire chronique, sans fièvre, avec excitation des forces vitales;" or as otherwise characterized: "Un délire général avec excitation, erascibilité, penchant à la fureur." "Un délire général, ou du moins sans idée dominante, sans passions fortement prononcée et permanente, mais avec disposition à la fureur."

Such, gentlemen, or something much after this fashion, is the definition, in the gross, of a malady which jurists wish us to accept in courts of law, and upon it to decide whether a human being shall be hung or set free; deprived of the use and control of his property; or whether third parties shall receive or be deprived of what would otherwise be theirs.

It is very difficult indeed, says Lord Hale, to define the *invisible* line that divides perfect and partial insanity, but it must be duly weighed and considered both by the Judge and Jury, lest, on the one side, there be a kind of inhumanity towards the defects of human nature, or on the other side too great an indulgence given

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to great crimes. That line of distinction, referred to by Lord Hale, says Stephens on Crimes, has never yet been fully traced; yet medical men are often tempted to be bullied and browbeaten into drawing a defining line, (which to jurists, even, is yet "invisible,") of a discretion or discernment between good and evil.

I have already said that Law and Medicine are conflicting on this question; but to a Pinel, an Esquirol, a Riemschneider or a Barlow it belongs, and not to a Hale or an Erskine, to say who is, and who is not, insane. As sick men define their sensations most correctly, why not the insane, with Shakespeare, say what is insanity?

> How pregnant sometimes his replies are! A happiness that often madness hits on, which reason and sanity could not so prosperously be delivered of.

They could do it as well as Jurists, whose training in Law does not qualify them more for questions of this nature.

The difficulties I have here merely glanced at were never more clearly or more forcibly set forth than by a distinguished member of this Society at its last annual meeting in Toronto. Dr. Workman, with a perfect causticity which he knows how to use, sketched some of those disputations between Law and Medicine, and the latter did not suffer in his hands. I should not allude to this question now, when so much remains to be said, were it not to point out the inconvenience, if not injustice, that is sometimes done by experts in courts of justice being outnumbered by medical practitioners who have given but little attention to the subject of insanity, and to whom the obscurer forms are quite unknown. If the most diligent and painstaking physician finds a lifetime too short to familiarize himself with the office, functions and derangements of all the internal organs of the economy, and gladly sees medicine having its explorers in certain parts of certain structures; how necessary is it, in cases where reason is not totally dethroned, that the duty of advancing an opinion which is to sway a jury, and bear consequences the most important, should be confided to those who are accustomed to detect those early and less marked varieties, which might escape the notice of less experienced observers. I am forced into those reflections by a consciousness that justice has sometimes miscarried in Canada by the manner in which numbers have outweighed qualification. In French, and other continental courts, for many years past,

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questions of insanity have been referred to experts named by government, who form a neutral council, and neither one side nor the other can furnish *ex parte* evidence of a technical character in rebuttal. At the meeting in February last of the Medico-Legal Society, a step in the direction indicated was made by James Appleton Morgan, who moved, "That the Society appoint a committee to inquire into and ascertain concerning the system of medical and surgical experts appointed by law and attached to courts of justice, understood to be provided by the laws of France."

In this Dominion we do not look, nor do we hope at once, for that complete system which obtains in Europe; but we may, by a tacit acquiescence, favour a plan or arrangement which would be productive of much good. I should say much more on this subject, but as two papers will be read before you on matters germane to this question, I shall leave to Dr. Workman and Dr. Hornibrook the completion of the task they have assumed.

UNION WITH THE AMERICAN MEDICAL ASSOCIATION.

You may recollect that at the Niagara meeting of this Association, in 1875, it was decided that, "in consideration of the true interests of Medical Science, it is desirable that a medical conference should take place between the American and Canada Medical Associations at some central point to be determined upon; and that the American Association be advised as to the desirability of thus becoming more intimately acquainted, and affording an opportunity for the discussion of medical and surgical questions on a common basis."

At the Louisville meeting of the American Medical Association, later in the same year, the subject was taken up, and it was resolved "that a committee of thirteen be appointed, whose duty it shall be to confer with a like committee of the Canada Medical Association at such time and place as may be agreed upon by the joint committee of the Associations." That joint committee met in Philadelphia in September, 1876, when it was unanimously resolved "that a *union* of the two Associations into one is desirable, and that the president of each be requested to bring the subject before his own Association, and present his own views upon the matter, in order that the question may be fully discussed, and action taken thereon by the members at their next annual meeting." The "next annual meeting" of the American Medical Association was held in Chicago, in June of this year, and the

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distinguished President, Dr. Bowditch, of Boston, fulfilled, in an admirable manner, the duty imposed upon him, by summarizing, in his address, the arguments for and against the proposed union.

Among the latter, speaking for the objectors, were: the difficulty already experienced of making so unwieldy a body as the American Medical Association, a working body, would be increased; the two languages used throughout this country; the difficulty of arranging the expenses of the united body; the widely distant places of meeting, &c., seemed against the proposed union.

The arguments in favour of the union were thus stated by Dr. Bowditch, and I give them in his own words as the best evidence of the kind feelings of the Association, and of the courtliness and urbanity of its President towards Canada and its young Association:

"*First.*—We should associate ourselves with a body of physicians all of whom have been educated under English influences, and many of whom have pursued their studies in England, and have received diplomas from the schools of that country. We all know the high standard of qualifications required by the British schools.

"*Second.*—Why may we not look upon such a connection as quite similar to that which has frequently taken place, and which will occur again hereafter, when a new state in this Union is formed?

"In that case, if a State Medical Society be organized, it has to send delegates to this Association. The only difference in the two cases, would be that Canada embraces a very much larger constituency than any of our new States would have.

"*Third.*—I am inclined to look with favour upon the proposed union from the standpoint of civilization itself. There can be no doubt, as already stated, that this American Association has been a great means for promoting good-will between the different sections of the United States. The proposed union with Canada will tend much towards the reuniting of two of the freest nations on the globe, and certainly civilization can get only good from such co-operation. All means that we can bring to unite mankind I hail with delight.

"*Fourth.*—I will allude to what will give me, and I doubt not many more, great pleasure. I wish the united professions to meet in the old cities of Montreal and Quebec, and pass up and down the noble St. Lawrence, magnificent as it is in the length, depth and breadth of its waters, and still more fascinating from its early associations with European civilization. I would like that we should all stand on the scarred battlements of Quebec, and I think perhaps we, of this country, might learn a divine lesson of magnanimity after war, if we could together look at the obelisk erected by the graceful action of the British government to

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the joint memories of Wolfe and Montcalm, two brave soldiers, antagonists in battle, but in death, joint heirs in the memories of mankind."

Dr. Bowditch, in conclusion, suggested that the whole subject be referred to the judicial council of the Association then in session. It was so referred; and the council soon after reported *adversely* to the proposed amalgamation.

That decision, gentlemen, relieves me from the duty imposed upon me of presenting my own views upon the matter at this, the first "next annual meeting" of the Canada Medical Association. Yet I may be permitted to observe, in view of the vast but sparsely populated territory, and of the very diversified elements that compose our less widely extended but more furnished neighbour, union for scientific purposes was alone possible; for all matters pertaining to medical ethics or education could not possibly have been discussed and settled by two peoples so near each other in many things, so far asunder in others. But I rejoice that the discussion of the subject has furnished occasion for the most friendly intercourse, where geographical boundaries were overleaped, and where forms of government did not obtrude but to give higher zest and relish to our intercourse. I beg, now, on your behalf, to reciprocate the sentiments of the President of the American Association, that each should send, annually, delegates to the other Association. Each will surpass the other in being neighbourly; and the delegates admitted to the other Association will be the representatives, from across the border, of mutual good will.

That has already been done this year, and I welcome most heartily our distinguished friends from the United States, and greet them in your name.

And now a word of explanation which might have come earlier. The Canada Medical Association did not ask for amalgamation; or to absorb, or be absorbed by, the American Medical Association; but merely for "a conference at some central point" so as to become "more intimately acquainted," and to discuss "Medical and Surgical questions on a common basis."

If our representatives at Philadelphia asked for more, they were not so commissioned; and in resolving that "a union of the two Associations into one, is desirable," they expressed their own views,—advanced and liberal, no doubt,—but spoke not for the Canada Medical Association, which, at Niagara in 1875, asked

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merely for a "medical conference," for the "discussion of medical and surgical questions on a common basis" without either Association losing, or wishing to lose, its identity.

But union of the two Associations is of the near future, and in a way little dreamed of, perhaps, by the superficial observer. History tells us that absorption usually goes on from the north. The statistics recently furnished show a birth-rate for some parts of Canada which has never been equalled. In the city of Montreal, last year, the birth-rate was 49 per 1000, and the French Canadian element alone gave 64 per 1000, the largest birth-rate that has ever been reached. Union, amalgamation, absorption, are of the near and certain future, therefore, if our large birth-rate, and the alarmingly small birth-rate in some of the States of the adjoining Union, continue as at present.

FÆTICIDE.

Here, gentlemen, my somewhat lengthy address should end, but yielding to the solicitations of some of my medical friends, and impelled at the same time by a sense of duty, I venture to touch upon a matter of extreme delicacy, but of vital moment. It is asserted by an American writer, (Dr. Allen,) that in *certain* classes of society in some parts of the adjoining Union, for a long time past the marriage relation would seem to be regarded, not as a Divine institution ordained by God for the preservation of the species, but as a matter of convenience and self-interest. To use his own words: "the standard of living is too high; the artificial wants are too many; confinement to household duties is irksome; children are a burden; the responsibilities of maternity must be avoided or limited. Hence in married life a series of 'nameless acts' take place, which need not be described." In those few grave, weighty, momentous sentences, gentlemen, are contained a picture of some of the chief causes of that alarming decline of birth-rate, and with it, and as a consequence of it, a gradual and pernicious change in the female physical organization. This, in thoughtful minds, has created alarm lest the *induced* organization become permanent in type. I know not how to enter upon the subject without running some risk of offending reserved and modest sensibilities. The crime I have faintly alluded to is but the logical outcome of those theories of genesis and of population which have been so enticingly placed before us by some very eminent scientists in latter years. There was a time when the birth-

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rate, in the United States, was as large as in Europe, or in any part of the world. In round figures the States doubled their number, from births alone, every twenty-five years. How is it now? Vital statistics are as yet too incomplete to base any accurate calculation for all the States of the Union, but those of Massachusetts and Rhode Island are most trustworthy, and afford information that is appalling.

The registration reports for Rhode Island, which I have just received from Dr. Snow, than whom no one is more competent, show an immense falling off in the birth-rate in that state, and leave but little room for conjecture as to the cause. Those of Massachusetts are equally significant; and were they not furnished as State Documents with all the weight of authority, I should not dare to allude to them.*

I fully admit the statement of Dr. Edward Jarvis that: "Massachusetts is one of the most favoured states in the world for the intelligence, at least of its native population, and for their thrift and wisdom in management." In the fifteen years preceding 1870 of the children born in the state only 13·91 per cent. died in their first year—the smallest infantile mortality, excepting Norway, in the whole world. And when it is added that this mortality "includes the record of the foreigners, whose infant mortality was in a larger ratio, as well as that of the native families whose infant mortality was at a lower rate than this average," it may be seen how devoted, how intelligent is the care of the New England mother of her infant.

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* The population of Rhode Island last year was 258,239, of these, classed by *nativity* the *foreign* born were 71,630, and the native 186,609. I continue Dr. Snow's figures: the report of births for 1875 gives 6,508, divided as follows:—American, 2,727; foreign, 2,906; mixed 875. The birth-rate for 20 years, says Dr. Allan, has steadily decreased among the Americans, but increased with the foreign, so that in 1875 the foreign had 58 per cent of the births in the state. Dr. Snow adds:—The native American population of Rhode Island, by parentage, has increased 12.89 per cent in ten years, while the foreign population, by parentage, has increased 80·11 per cent in the same time. In 10 years at the same rate the native population of Rhode Island would be 152,087 and the foreign 222,466.

In two years (1874-5) 8,221 married women in Providence, born in the United States, and of an age to bear children, had 2,532 children; while 5,919 married women of the same ages, born in foreign countries, had 2,912 children in the same time; that is, says Dr. Nathan Allan, the foreign married women, 2,302 less in number than the American married women, had 380 children more. If the American married women had had, in the years 1874-5, the same percentage of children as the foreign born women, there would have been 4,044 children of American parentage, instead of 2,532, a gain of 1,512 children. If the comparison is made between the American and Irish alone, by parentage, the former class would have had 4,249 instead of 2,532, the actual number, which would show a gain of 67 per cent in two years. I have selected Rhode Island because the system of Registration is singularly correct; and I have taken the *ipissima verba* of the reports. The statistics of many other states are equally appalling. Those of Massachusetts especially so.

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Once born, the New England child has a better chance of living than has the child of any other country or state; but Storer and other American writers have pointed out the ante-natal dangers to which the fœtus is exposed. And we are left no room to conjecture one at least of the causes.

Dr. Gould, of Boston, speaking of the births registered in Massachusetts 1859 to 1863, says: We have to record a continued deficiency in the number of births to be expected from the known population. 1865 was a year of war, and the diminished birth rate may be satisfactorily explained—the birth rate was only 4,097 in excess of death rate. But even then it was noticed by Dr. Geo. Derby that the births had diminished in all but three counties, while the deaths had diminished in every county except two. The population at that time being 1,267,059, there was one living birth to every 41.89 persons, and even then it was observed "that the births are most numerous in the counties containing crowded towns and a large foreign population." Dr. Derby, as if in anticipation, adds: It should not be inferred that the ratio of excess of births among the foreigners . . . is likely to lead finally to an extinction of the American element. But the most striking statement is that of Oliver Warner, Secretary of the Commonwealth: The native population of Massachusetts in 1860 was 970,752, the foreign population in the same year was 260,114. In that year the natives produced 16,672, the foreign 16,138. Dr. Derby in commenting says: The superior fecundity of the Celtic race . . . over the Anglo-American race is, we think, abundantly proved.

In 1865 the native population was 1,000,761, the foreign 266,270. They produced in the following year, the former 16,555 children, the latter 17,530—thus showing a productiveness of the latter over the former *four* times as great.

In 1867 the birth rate was 27.6 per thousand. Compared with the preceding year, the American births had diminished by 318, the foreign had increased by 922.

In 1868 the birth rate was 28.6 per thousand, an increase over former years, and it was then observed that the strictly American births had diminished 2.21 per cent.; the strictly foreign had increased .84 of one per cent.

In 1869 the birth rate was 25.5 per thousand. It had decreased by 52, while the marriages had increased by 970. It has now arrived that the excess of birth rate over death rate is but two-thirds of one per cent!

It is again observed that the American births had diminished during the preceding year, while the foreign had increased. The foreign births now exceed the native by 2,129, notwithstanding the relative smallness of the population.

In 1870, Dr. George Derby, Secretary of the State Board of Health, and Professor of Hygiene in Harvard University, reports the birth rate for Massachusetts as 26.2 per thousand, and adds: "The proportion of foreign births has remained quite constant since 1864; the purely American births have steadily diminished their ratio, and the births from mixed parentage have as steadily advanced." He continues: "Surely, and not very slowly, a mixed stock of Irish, Germans and Canadians is taking the place of the purely English stock which has possessed Massachusetts for more than two centuries. Here are facts for the statesman, the educator, and the moralist." In 1871, the same high authority states: "The superior fecundity of the foreign element among us is a fact fully recognized, and one which is confirmed in a most suggestive way from year to year by the registration returns. This year there was an increase of American births by 234, of foreign by 781.

In 1872, the births had increased by 3,444, but the deaths by 7,076, and the excess of birth rate over death rate was but ·563 of one per cent. Again is noticed a progressive diminution in the purely native births, and a corresponding increase in those from a mixed parentage. The excess of birth is now entirely with the foreign element. In one year the native births have increased by 1,125, the foreign by 1,992.

The report for 1873-74 I have not at hand, but that for 1875, just published, (1877), is more than confirmatory, and with it I close.

Dr. Derby has passed away, and Dr. Draper prepares, under direction of the Secretary of the Commonwealth, that portion of the thirty-fourth Annual Registration Report from which I glean that the birth rate is 26.63 for every thousand of the population. Still a falling off—28.3 having been the average for the pre-

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ceding three years, and 27.4 the average annual rate during the twenty-five years, 1851 to 1875, a period which comprised the Southern war, when the birth rate was low from other causes than those I have alluded to. "The fact remains," says Dr. Draper, "that our birth rate in Massachusetts is lower than we would like."

The birth rate among the foreign born in 1875 was 55.51 per 1,000, while the birth rate among the native born was 16.46 per 1,000 in the same year.

It may be consoling to say that the question of survival is of great moment. And here the advantage, as I have said, is entirely with the native American element.

In looking at these figures, is there not reason to fear the fulfilment of Dr. Knox's prediction, that were the North American continent not fed by a constant influx of European blood, it would again revert to the Red man as its sole possessor. But no! other causes than climatal are at work, for the sun shines on the willingly prolific, and the wilfully barren, alike; both are heated by the same summers and chilled by the same winters.

What I may have to say on this subject must not be considered as applied to any class of persons, but to individuals, here and there, in a class. A very small percentage of officious meddlesome females would disturb the birth rate of a large community. (At the moment of writing I can recall to mind the recent case of a well-dressed person, with somewhat of cultivation and refinement, who came from the adjoining Union, with shattered health and with heart bowed down, who admitted to me, unreservedly, having procured abortion, in her own person, fourteen times! She had so well learned the art from the fiend who had aided her at her first gestation that she required no assistance in the disposal of the subsequent thirteen.)

When persons have learned to regard man, in embryo, as a mere aggregation or union of fortuitous atoms, a plastic germ, a kind of colloid or protoplasm, which the chemical and mechanical laws of attraction and repulsion, selection and rejection, change and wave-like motion, may ultimately develop into a thinking being, but little heed will be given to the integrity of that immature creature suspended in the female womb. Broadcast over this land are sold pamphlets, the titles of which are alone attractive, instructing the female in measures for preventing conception, or for favouring abortion at an early period; and all in accordance with the views of certain classes of materialists and pseudo-philosophers. That the lesson is too well learned is evident from the experience of every physician who has written deprecatingly on the subject.

If the organization that now belongs to us had been progressively developed, the crime of fœticide would not be of that heinous

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character which it would be, were that organization transmitted to us, without mutation of any kind, from our first parents. If man derives his existence by a process of evolution from a simple cell way up through the tribes of zoophytes, lizards and monkeys, *cui malo*, then, now and again, to hook an embryotic mass from any part of that long living chain? The Bathybius or beetle; the cod fish or chicken; the mollusk or monkey is but a link, and man is no more; and it is of small moment which portion of that link receives the attention of the prudentialist.*

Such are the views adduced by those who consider that there is a period, anterior to which man is a mere protoplasm, having no rights superior to those possessed by it. And this revolting idea, which, when entertained, disturbs every system of moral and religious belief, is clutched at by those who might hesitate to interfere with that highest, noblest work in embryo, were man created perfect by his Creator, but who, in the theory of evolution, have an excuse for what is claimed to be, not a wrong or an evil *per se*, but, at most, an unintentional detriment to the State.

If what Herbert Spencer says be true, that of all antagonisms of belief, the oldest, the widest, the most profound and the most important is that between religion and science, he is at fault here. There is none, there can be no antagonism between physiological and pathological science and true religion in the subject I am now considering. What is the moral and ethical aspect of the question? What is its social bearing? What are its bearings towards religion,—not that religion of a particular system of faith, but that of acknowledgment to God and our obedience to Him and to His laws? What is its legal aspect?

MORALS.

In ancient Greece, where public opinion seemed to accord a licence to one sex without showing any corresponding indulgence to the other, where, as Zenophon says, woman was like the queen bee, dwelling continually at home and superintending the work of the household, marriage was regarded in a civic light, as a means of producing citizens. At that time the beauty of form of the offspring was the strongest desire of the wife. The intense æsthetic enthusiasm of the period led the Greek wife to pray, before all

* I do not use the term by which the prowler for nascent human prey, who would limit and control man's entity, is familiarly known, as it is not yet found in our dictionaries, and I shall coin no word for the purpose.

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other prayers, as Lecky says, for the number and beauty of her children. While in the ancient Roman family the authority of its head was absolute, marriage, and all that resulted therefrom, were protected by law and severe public opinion. For upwards of five hundred years, according to Valerius Maximus, the marriage tie was regarded as indissoluble, and according to Cornelius Nepos, the mother of the family was placed at the head of the table, and was even more honoured in her *maternal* character than in that of wife. The Roman matron was a name of honour, and Modestus interprets truly the feelings of the Roman people in defining the union of the sexes in marriage as a life-long fellowship of all divine and human rights; rights of the husband to generate and transmit; rights of the wife to conceive and bring forth; and rights of the fruit to be sheltered from ante-natal danger or injury.

At a later period when, after the Punic wars, Eastern luxury and Eastern voluptuousness overspread the Roman territory, there was a rebound into vice again; but while slaves took the place of wives, and undisguised, unblushing obscenity so flaunted at midday as to call for a law to prevent nameless crimes, even then the pregnant woman, whether wife or slave, was treated tenderly, and with the greatest consideration, for having consulted the perpetual endurance of the race, while contributing to a brief enjoyment.

When, later, female virtue suffered from the great wave of corruption that overflowed the land of the Cæsars, leaving but here and there examples of simplicity, gracefulness and chaste heroism, yet never, even in its worst times, was a nameless crime, now so common, even known to the people of that period.

At no time either during that profligate epoch, could be found anything so unblushingly wicked as the literature which finds its way so near to, and into, our Canadian homes, and which causes some alarm lest curiosity might prompt, and virtue might suffer from, a perusal.

I have been speaking of Pagan times: what shall I say of the early Christian, when a life of asceticism was considered the most perfect, and when marriage was tolerated "because it produced offspring," and was ordained by God for that purpose.

I had the curiosity to consult the *Senchus Mor*, comprising the ancient Laws of Ireland, to see what rules, if any, regulated the relation of the sexes, among the people of that prolific land.

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But while every conceivable form of crime, — many of them now unknown,—received attention; while all the relations of men to one another and to animals, are copiously treated; while for every conceivable forbidden act are provided compensation, exemption, fines, forfeiture, honour price, restitution; for man in every rank; for woman in every state; from the King on his throne to the cat mousing in the garret, no mention is made, no punishment is provided for that crime spoken of in Genesis xxxviii, 9th and 10th. It seems to have been unknown, and *I may add, is still unknown among that people.* But lest the designs of Providence should be thwarted through prudential reasons, such as now obtain in certain states of society, neglecting marital duty is dealt with as a crime, and classed for the purpose of punishment with mutilating the person, stripping the slave, &c.

The woman with child was treated then as now with the greatest tenderness. No neighbouring woman, with bodkin; no village blacksmith was there to rid her of her burden; no demon defiling the name of Doctor to step in, and, with shielded stiletto to unhinge the work of nature. The word of a woman in childbirth was taken before all other evidence; and if unintentional violence had been used; or disgraceful violence as it was termed ("in turthach is tar") which brought on premature labour, and not in natural course, injuring her person, or killing her child, her oath or statement when in labour, or the oath of a witness, before whom the woman in labour made the statement, was taken, and punishment followed, for the *Senchus Mor*, as dispensed by the Brehons, would not allow that a woman in labour could speak anything but the truth.

The *social* consequences of this evil are beyond measurement or conjecture. Adopting the views of Malthus when the converse obtains, when the law or principle by which population increases is violated, the evil must not be viewed as progressing arithmetically, but geometrically. In Canada the French population has doubled itself since its foundation every twenty years. What factors were the three thousand who landed here 210 years ago, in the 1,350,000 Canadians of French origin who now people both sides of the St. Lawrence and its many tributaries, the Ottawa, St. Maurice, and Richelieu, and extend into the North West, and Eastern Townships, besides, sending half a million to the adjoining

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Union! What numerous existences were compressed and included in those few lives of our early settlers.*

The question in its *religious* aspect is easily understood. The most welcome promise made by God was that mentioned in Deut. viii. 14: "There shall not be male or female barren among you." Property, titles, honours could not bring so much delight to a people who thought barrenness, in wedlock, a reproach. All Christian nations are instructed to believe, that matrimony has for its principal end the propagation of mankind; although it has other accessory ends, such as the comfort afforded by the society of man and woman, &c. In the exercise of the rights of marriage nothing can be done against its final end. Hence the condemnation of the crime (Genesis xxxviii. 9) in a mere natural point of view—God alone being the giver of life, the married parties are but His instruments in the bestowing of life. They have no more control over the beginning and continuation of life in the mother's womb than they have over the life of the child born. The fœtus in utero has the same right to the enjoyment of life, as the child after it is born. At the very moment of conception, there is, at least, material or physical life, and more probably *animated* life also, as many are of opinion that the *anima*, or soul, is united to the body at the very moment of conception. Even were that union to take place later, the fœtus enjoys already physical life of its own, and is intended by the law of nature to enjoy animated life: nay it has a right to it, of which right none, save the Master of life Himself, can deprive it. Hence, whether the union of the soul and body be consummated in the act of conception, or later, there is a violent and unlawful snatching of human life, if the fœtus be destroyed.

An objection may be raised: when the fœtus constitutes danger of death for the mother—a plea put forth by the strong and the

*It was always the aim and effort of French Canada to encourage early marriages, and to develop native population. In the middle of the 17th century, young girls were selected in France for their piety and virtue, and sent to Canada, where they were soon sought in marriage. A dower of twenty livres was given to each one, and families of ten children, resulting from the union, were presented with 1,200 francs, and 1,600 francs to families of twelve. In 1660 there were 2,500 persons in the Colony; yet in eleven years, 700 children were born. Even now, taking the whole Province of Quebec, we find an average of a fraction over seven persons under each roof, or more than 6·23 persons in every family. Among the births the preponderance of those of the male sex is remarkable, a percentage of 51·13 to 48·87 female. As the deaths occur among male and female children alike, the preponderance of the former is steadily increasing, and indicates in a marked manner a difference with what obtains in Europe where the male population is as 49 61 males to 50·39 females. The birth-rate in the city of Montreal, among the French Canadian population is now 64 per 1000, the largest birth rate in any country in the world.

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weak alike—can it not be considered as an invasor vitæ, an offensive enemy, and cannot the mother's life be protected against that enemy, at the risk of destroying it? That danger arises from nature itself; and the mother, by assuming all the risks of her state, has submitted to it, and must abide by it. Besides, if the fœtus be an invader, it is an innocent one, and can no more be punished than an insane man who would kill a fellow man: no more than an innocent man could be put to death to rescue another from certain death. If it is alleged that the mother has a right to preserve her life, the same may be said of the fœtus; and if the mother had a right to deprive the fœtus of life, the fœtus would have the same right to deprive the mother of hers. From this we derive the principle:

1. It is never lawful to procure abortion *directly*, even though the fœtus be supposed to be inanimate, under whatever plea of averting death. It were homicide; at least anticipated homicide.

The great principle underlying this question is, in a word: "Thou shalt not kill." God alone is the Master of life, and He alone can take it away. This is the universal Christian code. Christian, did I say? Nothing can be added to the Hebrew teaching in this regard.

The sin of preventing conception denounced in the Hebrew Scriptures, e. g., as in the case of Onan, as "evil in the sight of the Lord," and the kindred crime of fœticide is held up by the teachers of Judaism, the Talmudical and all Rabbinical writers as a sin which God can never pardon,—omnia peccata condona, Deus excepta—הוציא שכבת זרע לבטלה "*hotsi shichbat zerang leba tela*," i. e., who brings forth semen improperly or causelessly. "He who is guilty of the unnatural and detestable vice inherits Gehinnam," teaches the Talmud, in various places,—"he is worse than a murderer." In the Gemara or completion of the Talmud we are told that the disciples of a celebrated Rabbi asked him: how is it possible that one committing this sin should be worse, morally, than one who takes the life of a developed man who may be wise and good and useful to the State? The reply was: "in the latter instance he takes the life of a stranger, but in the former he unnaturally murders his own children." Again, in "Sepher Hammaaloth" it is taught, that he who does not duly perform the marital act is "a spiller of blood." To destroy the semen, or to procure abortion, is declared to be running counter to the will and intentions of the Supreme Creator who has already

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formed elsewhere the "zevug" or marriage match for the fœtus. The Talmudic code is crowded with the most minute instructions for the development of modesty and chastity. Thus, in the Mishua Treatise, Aboth, we read: "he who has had an *accidental* emission of semen is not to perform his ordinary devotions, much less the minister, or one who is to pray for the many." The constitutions concerning marriage, which fill a volume, give the most minute directions with regard to the "roheh keri," (qui vidit semen) in other words, precautions to prevent the use of the same for any other purpose except that of raising virtuous children in Israel. The act is to be performed with absence of all levity, and rather with prayerful aspiration, that the issue may be for a "kiddush hashem," i. e., to promote the sanctification of God's name, in darkness and with all modesty. Early marriages are most strictly enjoined as a consequence of all this. "He who does not marry and raise children causes the divine presence (Shechinah) to depart from Israel," see Yoreh Deah, p. 1. Again: "he who has no wife is not to be called a man; but when he marries and has children, his sins will be forgiven him." A man who knowingly marries a barren woman is denounced as a fornicator—Yoreh Deah.

The result of such teaching is evident among the Jewish people. They are singularly free from the detestable crime to which I am alluding, and from that other, anterior to it, for which I can find no name, but which is so repugnant to the designs of the Creator.

WHAT ARE ITS LEGAL ASPECTS.

According to law, causing or procuring abortion is a felony—a "crimen animo felleo perpetratum"—with a bitter or gallish inclination—a crime which at common law occasioned the forfeiture of lands and goods, and is classed with suicide and manslaughter. It is not, indeed, murder in the eyes of the law, for in order to make the killing, murder, says Stephens, it is requisite that the person killed be a reasonable creature, in being, and under the King's peace at the time of the killing. To kill a child in its mother's womb, therefore, falls under a different description of crime. But it approaches more nearly to murder, and murder most cowardly, than any other crime; for it cannot be pleaded that it is done without malice aforethought. The malice prepense, *militia præcogitata*, does not require to be towards the unknown,

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unseen fœtus, and is, therefore, not so much malevolence to the deceased infant in particular, as any evil design in general—the dictates of a wicked, depraved, and malignant heart, as Foster expressed it,—une disposition à faire une male chose—which may be either expressed or implied in law. It may be taken for a general rule that an act of this nature is malicious, and *should* amount to murder, unless where *justified* by the command or permission of the law, or *excused* on account of accident or of self-preservation, as in cases where the accoucheur risks the life of the child to save that of the mother. But without these circumstances of justification, excuse, or alleviation, the earnest and oft times tearful plea "I don't want to be bothered with any more children" would not be sufficient in any court of justice, still less in the forum of one's conscience, where a faculty may still exist of judging of conduct with reference to some standard of right and wrong. There was an old Roman law by which the slayer of her own child was punished in a much severer manner than any other kind of homicide. After being scourged, the delinquent was sewed up in a leathern sack, with a live dog, a cock, a viper and an ape, and so cast into the sea. Solon the wise, in his laws, made none against this crime, apprehending it impossible, as Cicero says, that any one should be guilty of so unnatural a barbarity.

I have been at some trouble to search out the law on this question, as it has been more than once urged that the death of the mother alone jeopardises the life or liberty of the fiend who accommodatingly assists, or the woman who wantonly permits, or procures, or in any way wilfully occasions, a violent interference with the law of nature; and I find that as society *advanced* (?) the law was modified. By 43 Geo. III., c. 58, and 9 Geo. IV., c. 31, s. 13, it was provided that to administer a destructive thing to procure the miscarriage of a woman *quick* with child should be a *capital* felony; and if she should not be proved to have been *quick* with child, a felony punishable with transportation. But the law is now governed by 7 Will. IV. and 1 Vict., c. 85, s. 6, which provides that whosoever, with intent to procure the miscarriage of any woman, shall unlawfully administer to her, or cause to be taken by her, any poison or other noxious thing, or shall unlawfully use any instrument or other means whatsoever, with the like intent, shall be guilty of felony and liable to transportation for life, or not less than fifteen years, or to be imprisoned for any term not more than three years."

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What says *science?* Apart altogether from those numerous ailments and diseases which follow in the train of such violations of the laws of God and of nature, and which a volume would be insufficient to delineate and pourtray, I shall merely observe that there is a peculiar condition of the os uteri brought about which is often the cause of subsequent miscarriages. The neck of the uterus, as Depaul observes, is a sort of sphincter muscle; and in many women this is in a lax condition, predisposing readily to abortion. With it there is indeed "a special irritability of the uterus, exciting it to relieve itself of its contents." How frequently do we not notice this condition in meddlesome females who, in the early months of married life, abhorring maternity, prevent it! yet who, at a later period, would sacrifice every thing short of life itself to regain the health they had wantonly sacrificed, and some at least of the lives they had so mercilessly brought to nought.

The indurated or hyperplastic condition induced by this wicked practice, indisposes the uterus to expand and yield before the growth of the fœtus at a subsequent gestation. The uterus, on account of that induced congestion or hyperplasia, is, moreover, prone to assume an abnormal position, and to add thereby another element of discomfort to the mother, and of danger to the safe progress of future gestation. When, as it often happens, future gestations are denied, the sufferings are not less severe. Who, amongst us, cannot recall the haggard, anxious expression, the hollow cheek, the sunken eye, the pallid, sickly countenance, the uncertain gait, the pain in forehead, side, back and limbs, and that indescribable sensation of fullness, yet of emptiness, that feeling of dragging, or of gnawing in the hypogastrium, which attends the wakeful moments, and disturbs and hinders rest, and which is as

> The pang where more than madness lies,
> The worm that will not sleep, and never dies.
> Thought of the gloomy day and ghastly night
> That dreads the darkness, and yet loathes the light;
> That winds around, and tears the quivering heart!
> Ah, wherefore not consume it, and depart!

But to come back again from Byronianism to plain prose, can I exaggerate the misery and distress which follow in the wake of the unhappy misguided deflowerer of her own womanhood, who so completely divorces herself from all freedom from sickness or suffering for the future.

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I can but faintly allude to that other sinful evil; that partial and imcomplete act, equally, if not more mischievous, which the law does not contemplate; which the moral law alone can touch; and which God alone can see; yet which, to mention, reddens the cheek with confusion. To reduce to nothing, when immature, and to be no longer, is, without doubt, say some, a great gain; but to have never been, save in the fecundating principle which found no matrix to foster and maintain its life, is better! Oh-Shame, where is thy blush! If there be such a power as Conscience, where is its office? Yet women, otherwise delicately, minded, chaste and virtuous; and husbands, otherwise considerate, and worthy of respect and honour, combine to thwart the designs of marriage; to engender a whole train of evils in one at least or in both; to violate the laws of God and of nature; and to conspire against the State.

This vital problem is obtaining solution too near our own doors for us to remain indifferent spectators. So far the pernicious teaching has done but little injury here; but, gentlemen, who is there amongst us to-day who will not be prepared to admit it has done some? Who amongst us has not been appealed to by married women in fashionable society to thwart the designs of Providence in their regard? And who amongst us does not know the earnestness of that appeal, where delicate health, narrow means, the claims of society, the displeasure of a husband, are urged most tearfully, in support of an undesired maternity, by those whom we would be disposed to befriend? What young man amongst us who has not been obliged to reject a proffered bribe where his impecuniosity seemed to give hope to the would be fœticide? What practitioner, who has not found his advice "not to kill" spurned by one who looked to him for help in ridding her of the fruit she was bearing? Some years ago I was present at an interesting meeting of Physicians at Malone, N. Y., and the aged President dwelt, among other things, on this topic. He told us of a married lady, one of his best patients, healthy and affluent, who wished to be relieved, at an early period of gestation, of the legitimate fruit she was bearing. He expostulated, coaxed, and at length, threatened. She left his office, indignant at his want of complacence; and although he had attended her and her family for years previously, she never afterward went near him. But to continue his own story: "I had my own satisfaction, for of a fine afternoon, a young lady of eighteen summers,

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full of life, and health, and beauty, might be seen passing my window, little dreaming, and I would not have her know, how much she was indebted to the humble old man in his office near by for the continuance of the life she now so much enjoyed."

Gentlemen of the Canada Medical Association: Why do I enter into this matter at all while the beautiful and interesting fields of scientific discovery are so inviting? Believe me, I have no relish for it, and more than once have I turned with loathing from the task. But, let me ask, is there no necessity? Do you not perceive in spots here and there in our Canada, and chiefly along the border, a knowledge of the physiology of conception, and alas! a knowledge of the means of its prevention, which would be better unlearned? It could not be that crimes which a Storer denounced in Massachusetts; a Deforrest or a Thomas in New York; or an Allen in Rhode Island, could have continued to be confined to the adjoining Union. Like the Colorado bug it would cross the border, and produce its work of mischief here. And it has been suggested to me that a few plain words proceeding from this chair—having a weight, a character and a quality which might be attached to the utterances of the occupant, honoured, for the moment, as the mouthpiece of this important Association—would not be misplaced or ill-timed.

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REPORT ON PROGRESS IN CANADIAN MEDICINE.

BY

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It is almost or quite impossible to expect to be able to condense into a short report the progress made in Medicine during the past year. This, for the Science at large, is done annually, by some one of the great chiefs in the profession at the meeting of the British Medical Association, where ample space and time are allowed for this important object. Although, therefore, I believe it is expected of this Committee to make some report of this kind, I have (distrusting my ability to deal with so large a subject), thought it better, on this occasion to deviate from the usual custom and, instead, to bring before this Association an account, as condensed as possible, of most, if not all, important papers or reliable observations which have, within the past twelve months, been published by Canadian authors. These have of course been almost entirely collected from the pages of our Canadian journals.

I hope, therefore, by this means, to show to what extent Canadian physicians are holding a place in the great field of work open to those engaged in practical medicine; and I think it will be found that many of the articles spoken of are well worthy of any country, and make us feel that we have amongst us observant physicians and medical scientists of whom we have reason to be proud. And here I would note the fact, as confirming this statement, that within the past year several of the original papers from this country have been copied into American, British and some foreign Medical papers, and in some cases their contents most favourably commented upon. But I am forced at the same time to say that, having for the purposes of this paper examined the files of all our native periodicals for the year, I am surprised to find how small an amount of material and how few contributors are there to be found. One cause for this would appear to be that, all here being general practitioners, and seeking to make the publication of cases serve the purpose of gaining reputation, the majority of the cases sent to journals are reports of *Surgical*

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cases, because these, if successful, tend, perhaps more than any thing else, to give a local (or even more than local)*renommée* to the operator. I would not be understood as objecting to this at all, but I am now presenting the claims of *Medicine* as against Surgery for a fair share of attention. We know quite well that, with the great majority of practitioners, their cases of Surgery are very few and far between, whereas they are daily and hourly treating and observing cases of *Medical* disease, acute and chronic. Nothing is more certain, therefore, than that there ought to be a much larger outcome than there is from such an extended field and so many labourers, in the way of published cases and papers upon strictly Medical subjects; and I would suggest that a further incentive would be afforded to all our medical men to contribute such to our Medical journals if an abstract such as the present were yearly laid before this Association by the Chairman of the Committee on Medicine; and I further believe that additional interest would necessarily be taken in such literary work if this Association were annually to print these Reports, as I understand it is contemplated doing this year.

GENERAL DISEASES.

Dr. R. P. Howard, of Montreal, has communicated by a paper to the International Medical Congress, held at Philadelphia, four cases of Progressive Pernicious Anæmia. The symptoms are related in detail, both they and the post-mortem appearances being perfectly characteristic of this disease. An exhaustive analysis of all recorded cases follows, as also a tabulated list, showing at a glance the chief features of each one. The conditions under which these cases have, as far as known, originated, may be thus classified or grouped. 1st. Pregnancy, oft-repeated. 2nd. Parturition; and these two conditions appear to be specially frequent. 3rd. Chlorosis, rare. 4th. Chronic diarrhœa or intestinal catarrh, which is by no means so often as some authors state. 5th. Blood-waste, direct and indirect, from protracted menorrhagia or leucorrhœa, chronic ulceration, &c. 6th. Dyspepsia. 7th. Extreme poverty or poor diet. 8th. Jaundice, the only known antecedent in one case. From a consideration of his own cases compared with all those reported by others, the writer draws the following conclusions: 1st. That all the various forms of anæmia may occasionally take a pernicious and progressive character and prove fatal. 2nd. That such is not unfrequently the case with the anæmia

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of pregnancy and of parturition, while the converse is true of chlorosis. 3rd. That it has not been proved that there is a distinct variety of anæmia, having an etiology and pathology peculiar to it, demanding the names progressive and pernicious. 4th. That neither the spleen nor the lymphatic glands usually present any, much less any special, lesion in pernicious anæmia. 5th. That it remains to be proved that hyperplasia or other change of the bone-marrow is a cause of anæmia. 6th. That if it be a cause it has yet to be shown that it should be especially styled pernicious and progressive, and that the weight of evidence is at present opposed to that view. 7th. That it is premature to regard pernicious anæmia as a myelogenous form of pseudo-leukæmia. 8th. That while pernicious anæmia is rather more frequent in females than in males the difference in liability of the sexes is not very great.

On this same most interesting and novel subject, Drs. Gardner and Osler of Montreal, publish (*Can. Med. and Surg. Journal*) a complete and typical case. The patient, a man, æt. 52, came under observation in November, 1876. About 5 years ago he had suffered severe family affliction, which he had taken much to heart, and gradually failed in health from that time, became weaker, and lost colour. In 1876 became subject to attacks of diarrhœa. The symptoms at first were weakness, shortness of breath on even slight exertion, and diarrhœa, remarkable waxy pallor of the skin and mucous membranes, urine normal. Physical examination of the chest showed nothing abnormal except loud bruit at the base, and of the great vessels of the neck. Spleen and liver not enlarged; no discoloration of the skin; no enlargement of the lymphatic glands. He was treated with Liq. Ferri. Pernit. Diarrhœa improved, but soon the symptoms became intensified; weakness was extreme; drowsiness and deafness were added, and slight œdema of the ankles and eyelids appeared. On the 11th January, 1877, he had an attack of syncope, followed by prostration and rambling incoherency, and he died on the 14th. The blood was frequently examined during life. The red corpuscles presented characteristic changes, all which, together with careful measurements, are recorded *in extenso*. There were no nucleated red corpuscles. The white corpuscles were not relatively increased.

Autopsy.—Muscles of a remarkably healthy red color; heart valves normal, substance exceedingly pale, with marked faded-leaf appearance; spleen soft and flabby; nothing special in the

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other organs. A striking feature, however, is noted as being the extreme anæmia of all the organs, the right kidney alone excepted. On microscopical examination, the heart was found in a state of advanced fatty degeneration. The blood showed the same general character noticed during life. In the marrow were found, besides the elements normally present, the so-called "transitional" forms of Neumann—cells containing red corpuscles—and the octahedral crystals of Charcot. The remarks which follow the relation of this case ably discuss its peculiarities and its bearings upon the pathology of the disease. Dr. Osler has exceptionally observed these very small corpuscles even in healthy blood, but concurs in viewing their numerous presence as probably characteristic of this progressive form of anæmia, though possibly found in other chronic diseases. As regards the marrow, their conclusion is that, "the few facts we have are opposed to the view that in chronic diseases, accompanied with anæmia and wasting, hyperplasia of the marrow of the long bones occurs as a secondary change," and end by observing that, in this case, they believe the marrow to have been the "*fons et origo mali.*"

Drs. STEWART and HURLBURT, of Brucefield, Ont., (*Can. Lancet*, Jan., 1877), present two very carefully prepared reports of cases of leucocythæmia, the one being of *splenic* form, the other of the *lymphatic*. In the first case, when originally observed, the symptoms had consisted in weakness, diarrhœa, some degree of anæmia, slight enlargement of the liver and decided enlargement of the spleen, which was tender and sometimes painful. There were no enlarged glands. The blood showed great increase in the leucocytes, one white to every two red. He was treated by phosphorus gr. 1/8 twice a day. This, in diminished amount, was persevered in for a length of time. Some diminution in the area of the spleen is reported, but no real amelioration in his condition, and he died some months after with a colliquative diarrhœa.

The second case was in a young woman, who, when first seen, exhibited very considerable enlargements of numerous cervical, axillary and inguinal glands. No enlargement of either liver or spleen. White cells of blood very much increased in number. There was dyspnœa and an asthmatic cough. The patient died about three months subsequently with symptoms of asphyxia from pressure upon the trachea or large bronchi.

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DIATHETIC DISEASES.

Dr. GEO. ROSS, of Montreal, gives a case of acute rheumatism treated with salicylic acid, and accompanied by a chart of the temperature throughout. This case had been selected from amongst a number treated on the same plan, because it illustrates remarkably the good effect of the drug upon the pain and upon the pyrexia.

Dr. CATTERMOLE, of London, Ont., (*Can. Lancet*, Nov., 1876), relates a case of *tuberiform melanosis*. The first spot noticed was upon the scalp, where a tumor of considerable size soon formed. This was followed by the appearance of small hard round nodules over the trunk and extremities. In some months these had much increased in size, and there were signs of similar disease having progressed in both the thoracic and abdominal viscera. This was accompanied by cachexia and very decided emaciation. The left eye also suffered, the deposit commencing in an unusual manner in the inner canthus, and not in the interior of the globe. Many of the superficial growths were bluish-black in colour. There was no autopsy.

ZYMOTIC DISEASES.

Dr. BENSON, of Chatham, N.B., (*Can. Lancet*, Nov., 1877), speaks very highly of chlorine water in diphtheria. Three teaspoonfuls to be given every two hours, and relates several cases where he believes the success was due to this medication.

Dr. G. R. COOK, of Gananoque, Ont., (*Can. Med. and Surgical Journal*, 1877), also writes favorably of the use of chlorine in this disease. He recommends its preparation by a formula in which hydrochloric acid is added to chlorate of potash. He lays much stress, however, also upon the coincident employment of ice, both internally and externally.

Dr. OSLER, of Montreal, has given two very valuable papers upon *Smallpox*. (*Canada Medical and Surgical Journal*, 1877.) One upon the hæmorrhagic variety of the disease, and the other upon the initial rashes. Both are entirely founded upon the author's own observations made at the General Smallpox Hospital, of which he had the medical charge. The discussion upon the hæmorrhagic form of the disease is accompanied by a tabulated statement of twenty-seven cases, showing their relation to previous vaccination, and the prominent symptoms in each case. Autopsies were made upon several of these cases, and a condensed account of the

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pathological features is found recorded, together with the results of microscopical examinations of the blood and other fluids. Dr Osler's article upon the initial rashes in smallpox is one of the best and most complete to be found anywhere. Indeed I am not aware of any special monogram on this subject in the English language. Almost every known form of initial rash has come under the writer's observation, the number of cases having been very large during the epidemic of the disease. It is surprising how this very important matter has been neglected by our English authors—and even amongst foreign writers there are but few descriptions of these peculiar appearances which are at all satisfactory. Every one who has had experience of a smallpox epidemic knows what frequent mistakes of diagnosis are made by those who are not acquainted with the peculiar rashes which precede the eruption of the true variolous papule. I look upon this paper especially as a valuable addition to our Canadian medical literature, and one which shows the evidence of careful, constant and minute observation put to a good use.

DISEASES OF THE CHEST.

Dr. GILBERT, of Sherbrooke, (*Canada Medical and Surgical Journal*, 1877.) adds one more to the now numerous cases of extensive pleuritic effusion cured by the use of the aspirator trocar. The case was very serious from the amount of the fluid, and the boy would certainly have died had not the chest been promptly evacuated. Two tappings, one of 11 pints and the other of 8 pints, of serum were sufficient to complete a cure. There can be no doubt that the satisfactory nature of this treatment of a formidable and, at best, otherwise tedious complaint, cannot be too widely known or too well understood. No physician at the present day can afford to be without his aspirator.

Dr. G. ROSS, of Montreal, (*Canada Medical and Surgical Journal*, 1877) describes a case of fibroid contraction of the right lung, with consequent dragging of the heart to that side, and secondary tricuspid regurgitation. It is a pure example of this somewhat unusual pulmonary disorder, and exhibits in a marked degree the effect of its presence upon the right chambers of the heart. It is also interesting clinically, as showing the signs of a dilated tricuspid orifice, without the usual accompaniment of affections of the other valves.

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Dr. REDDY, of Montreal, (*Canada Medical and Surgical Journal*, 1877), reports a case of pneumonia which proved fatal by the supervention of *acute meningitis*. There had been some doubt as to the nature of the case, it having been first looked upon as typhoid fever, but the autopsy fully confirmed the fact of an acute inflammation of the meninges on the convexity and base of the brain, with effusion of lymph and pus. The details of this case are very interesting in a diagnostic point of view, and its extreme rarity renders it important.

Dr. DRAKE, of Montreal, (*Canada Medical and Surgical Journal*, 1877), further contributes a case where a patient died from the combined effects of pulmonary tuberculosis and malignant disease of the peritoneum, the unusual association of these two constitutional conditions in one person being worthy of a passing note.

Dr. T. G. RODDICK, of Montreal, (*Canada Medical and Surgical Journal*, 1877), gives a good report of a case of aneurism of the arch of the aorta where the most remarkable feature present was the great pressure exerted by the tumor upon the large veins, causing immense dilatation of the superficial veins of the upper extremities, neck and face. The features of the patient were purple, suffused, and bloated, the indications of cerebral congestion were also sufficiently marked, consisting in advancing drowsiness and a finally almost insensible condition.

DISEASES OF THE NERVOUS SYSTEM.

Dr. JOHN BELL, of Montreal (*Canada Medical and Surgical Journal*, 1877), contributes a case of Cerebral Aneurism. A woman, æt. 40, who had been in fair health, except rather frequent severe headaches, slight loss of memory, and occasional turns of giddiness, was one morning found insensible in bed. She was rigidly extended, with her arms to her sides and the thumbs strongly flexed across the palms of the hands. The next day she had left hemiplegia and was comatose, and died the same night. The diagnosis was extravasation of blood into the anterior portion of the right hemisphere. At the autopsy a large extravasation was found in the right sylvian fissure, and considerable clotted blood lay at the base of the brain. Ventricles healthy, and nothing abnormal about the great ganglia at the base. The source of the hemorrhage was ascertained to be a small aneurism situated in the fork of the chief bifurcation of the right middle cerebral artery. This had ruptured, and the blood had escaped through a large ragged orifice. The remaining vessels

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of the brain were found healthy, no atheromatous change being detected in their walls.

Dr. DRAKE, of Montreal (*Canada Medical and Surgical Journal*, 1876), relates an instructive case of *Sunstroke*, which by its success well illustrates the value of quinine as an antipyretic pure and simple. This patient, upon admission to the General Hospital, was in a most alarming condition owing to insolation. There was complete insensibility, contracted pupils, burning skin, shallow breathing, small, feeble, very rapid and irregular pulse. His temperature showed the unusually high figure of 107.8° F. He had ice to the head and 30 grs. of quinine in three doses at intervals of half an hour. In six hours temperature was 103° F., and in fourteen hours 100.4°. The next day he was conscious, and got gr. v. quinine every four hours—the temperature never again rising above 100° F. The secretions were soon restored, and convalescence was rapid. Calling to mind our experiences of a few years ago when sunstroke was very prevalent in Montreal, and this action of quinine was not so well understood, we are struck with the valuable and powerful assistant to outward cold which we thus have called in.

Dr. GEO. C. DUNCAN, Surgeon Allan line (*Canada Medical and Surgical Journal*, 1877), gives a case of *Tetanus* treated by chloral. It occurred after amputation of a finger. There was marked trismus and spasm of other muscles, a rapid pulse, but no considerable elevation of temperature. He was treated by chloral hydrate in full doses (℈ to ʒ ss p. every three to six hours). The medicine invariably controlled the spasms, and the case ended in recovery in ten days,

Dr. DRAKE, of Montreal (*Canada Medical and Surgical Journal*, 1877), also furnishes a case of Traumatic Tetanus which was treated by the novel method of nerve-stretching. As a therapeutical study this report is well deserving of the attention which has been bestowed upon it in many current medical periodicals. The case (which arose from a rusty nail run into the sole of the foot) was one of great severity, and was most carefully watched by Dr. Drake and his hospital assistants throughout its course. When admitted, the tetanic spasms were so intense that it was determined at once to resort to the proceeding claimed to be successful by Mr. Callender and certain French physicians, viz., stretching the sciatic nerve from its spinal attachments. This was done under chloroform, and done most thoroughly. Shortly after, was administered calabar bean in full but carefully regulated doses according to the effect produced.

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A thoroughly reliable extract was used and given hypodermically. Chloral was given at night. He was kept thoroughly under the physiological influence of the calabar for five days, and moderately so for eight days more, with very marked effect upon the spasms, for he was often kept for hours in a perfectly flaccid condition; but they invariably returned, and he died on the fourteenth day.

Dr. Geo. Ross, of Montreal (*Canada Medical and Surgical Journal*, 1876). Case of *Glioma* of the corpus striatum in an elderly woman where, from the symptoms, the diagnosis had been one of cerebral softening in that region. These consisted in a gradual impairment of the mental powers with delusions like those of insanity, progressive weakness of the limbs, a gradual creeping on of hemiplegia, and finally death from coma. A small firm tumor was bedded in the left corpus striatum, and was proved by microscopical examination to be of the nature of *glioma*.

The same writer also gives three cases of *Locomotor Ataxia* with varied but all very characteristic features of this disease. One was treated with phosphorus, another with potass. iodid. as there was a suspicion of syphilis. In neither, however, were the results very satisfactory.

Also, a case of marked and advanced Progressive Muscular Atrophy, in which a treatment by phosphorus was essayed without any appreciable benefit.

And lastly, two cases of acute Tubercular Meningitis as part of a general tuberculosis. A special feature in one of these cases was intense pain in the back with retraction of the head, leading to the suspicion that the meninges of the upper part of the cord were also affected, but the autopsy failed to show anything abnormal in this part.

DISEASES OF THE DIGESTIVE ORGANS.

Dr. Donald Baynes, of Montreal (*Canada Medical and Surgical Journal*, 1877), reports that a person came to him having suffered during three weeks from thirst and great dryness of the mouth, rendering mastication almost impossible and much disturbing his sleep. This singular condition of things was found on examination to be due to suppression of the salivary secretion A probe was passed into Steno's-duct, and by this means a current of electricity applied. The effect was immediate, and two applications completely restored the secretion. No cause is assigned for the trouble.

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A remarkable case of *Gastric Ulcer* with entire suppression of urine for thirty days, by Dr. GEIKIE, of Toronto has been published in *Can. Lan.*, but has already been read before this Association at its last meeting.

Dr. RODDICK, of Montreal (*Canada Medical and Surgical Journal*), mentions the occurrence of a case of *Cirrhosis* of the liver with enlargement. There was nothing of special note except the fact that, instead of being contracted, as is so commonly the case, the organ was found very much enlarged, weighing seven pounds. It presented all the characteristic features, general and histological, of true cirrhosis.

A case of *Cancer of the Liver*, by Dr. JOHN BELL, of Montreal, (*Canada Medical and Surgical Journal*, 1877), is unique, and should have, if time allowed, a more extended notice. The peculiarities here lay both in the clinical history, which was very deceptive, and in the pathological conditions, which were decidedly unusual. The subject of this affection was an elderly lady, who, when she came under observation, was found to have a large fluctuating tumor in the right side of the abdomen which had already been diagnosed as ovarian, and operation advised at a subsequent period. She soon became jaundiced, and suffered much pain in the hepatic region. It was found that the tumor could be traced downwards, until ending in a constricted portion apparently continuous with, or attached to, the right broad ligament. The idea of an ovarian cyst was maintained until the patient's death, which occurred shortly after, though there was also strong suspicion of the co-existence of malignant disease of the liver. The autopsy showed the tumor to be an enormously distended gall bladder. It was not attached to the pelvic organs, but the seat where it *had been* so adherent was plainly marked. A large cancerous mass occupied the neck of the viscus and completely occluded the cystic duct.

Dr. CATTERMOLE, London, Ont., (*Can. Lancet*, May, 1877), records a singular case of Abscess situated in the gastro hepatic omentum. The patient, æt. 62, had been under treatment for a short time for what was considered to be an attack of acute hepatitis, but, on the 20th day of his illness, he suddenly felt as though something had given way in his abdomen, and immediately fell into a state of collapse, in which he shortly expired. At the autopsy it was found that he was the subject of an abscess containing 7 or 8 oz. of pus, and situated in the gastro hepatic omentum. It had ruptured into the peritoneal cavity, and proved fatal

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by shock. No clue was found for the origin of the abscess in this unusual locality.

Dr. S. P. FORD, of Norwood, Ont., (*Can. Lancet*, Feb., 1877,) gives two cases of Ascites, successfully treated with iodine injections. The first patient had already been tapped sixty times, from eighteen to twenty-four quarts of fluid having been removed each time. The same plan was followed for some time longer, it being found requisite to repeat the operations at the short interval of ten days. At last it was resolved to resort to injection of iodine. Two ounces of tr. iodi diluted with an equal amount of distilled water, were accordingly thrown into the cavity of the peritoneum after having withdrawn half the usual quantity of liquid—the remainder was then removed. The operation was followed by a chill and slight peritonitis. The fluid re-collected to some extent and he was tapped three times more. From this period no dropsy returned, and he is reported alive and well several years after. The second case was that of a maiden lady, æt. 45, who had already had her abdomen tapped eight times. The same procedure was followed, and ended in complete and rapid recovery. It is no doubt possible, though very unusual, for ascites to occur from functional disease of the peritoneum, without any organic disease of the contained viscera. To such cases the above treatment might be successfully applied.

Drs. ROSS and OSLER, of Montreal (*Canada Med. and Surg. Jour.*, July, 1877), present a rare case—one, viz., of Aneurism of the Hepatic Artery.—Only five cases somewhat, and none exactly, similar are to be found recorded anywhere. In many of its particulars it is quite unique, and is held to be of considerable value with reference to the functions of the liver. The clinical features here consisted in marked symptoms of acute suppurating hepatitis. Rigors, high fever, emaciation and sallow skin, with increasing and ultimately very great enlargement of the liver. There had been an entire absence of dysentery, hemorrhoids, disease of the rectum or prostate, or any other possible cause for the production of abscess of the liver. This was demonstrated at the autopsy to be an aneurism as large as a pigeon's egg, situated upon the right branch of the hepatic artery. The liver weighed ten pounds, and was almost entirely converted into a congeries of abscesses of various sizes. The rest of the arterial system was healthy.

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Dr. BROSSEAU, (*L'Union Médicale*, 1876), records two cases of Imperforate Anus, successfully operated upon for re-establishment of the natural passage. Of course, these observations are principally from a surgical stand-point, but at the same time they contain a good deal that may be found interesting from a medical point of view. The length of time during which a new-born infant may live with entire occlusion of the alimentary canal is shown by one of these cases. The parents objected most strenuously to any operative interference during a period of 27 days, after which unusual time, the child, strange to say, was found still alive, and ultimately survived the necessary operation for the re-opening of the anal canal.

Dr. BROWN, of Galt, Ont., (*Can. Lancet*, July, 1877), reports a case as one of *Intussusception* of the bowels. Sudden severe abdominal pain in the right iliac fossa, vomiting and constipation. Purgatives were rejected. Moderate fever ensued, but under the use of ordinary enemata, rest, and opium, an apparently complete recovery ensued. Seven weeks after, following indiscretion in eating, a violent onset of similar symptoms occurred, with marked pain and tenderness in the right iliac region—evidences of acute peritonitis—and death in 36 hours. There was no autopsy. The theory of the writer is that the original attack was one of invagination of the bowel, which had been replaced, but had again become impacted during the subsequent attack of vomiting. The case is interesting in itself, but is of course quite incomplete without the *post mortem* record. I think that the diagnosis is open to many objections. The symptoms, I believe, point rather to a peri-cœcal inflammation (originating, possibly, in a perforation of the appendix)—a state of temporary cure—then a second attack of the same, which, involving the general peritoneum, proved fatal.

DISEASES OF THE URINARY ORGANS.

Dr. GEO. ROSS, of Montreal (*Canada Medical and Surgical Journal*, August, 1877), case of *Tuberculous Nephritis*. The interesting features in this report of a rather common affection were: the very frequent occurrence of severe rigors followed by high fever, absence of renal tumor, the very minute quantity of pus always present in the urine. In all other respects it perfectly corresponded with the typical descriptions of the disease. One kidney was found entirely cystic and had become small and shrunken. The other was large, and showed the caseous disease in its earlier stages.

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Same writer (*Canada Medical and Surgical Journal*, Aug., 1877), case of *Diabetes Mellitus*. This was an advanced case of the worst form of the disease. Treatment was only of temporary benefit, and the patient soon become anasarcous, developed phthisical disease in his lungs, and died. At the autopsy the kidneys were found large but healthy. In the upper lobe of the right lung a medium-sized cavity of the peculiar character found in diabetic subjects.

Same writer (*Canada Medical and Surgical Journal*, Feb., 1877), case of *Acute Bright's Disease*, accompanying pregnancy, with premature delivery and rapid subsequent death from peritonitis. Many interesting points are raised by the recital of this case, such as the relation of the pregnancy to the peritonitis, the advisability of inducing miscarriage, the beneficial effect of the hot-air bath, and the reason for the peritonitis. Was it hospitalism; or was it the blood crasis of Bright's disease?

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REPORT ON THERAPEUTICS AND NEW REMEDIES.

BY

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CHAIRMAN.

The watchword of a scientific profession must ever be progress. To stand still is to go backward. In no department of our art has this progress been more apparent than in that of Materia Medica and Therapeutics. Every year adds new remedies to the long list already in use, and finds out new modes of applying old and familiar ones. Modern investigation has done much in the way of adding to our knowledge of Materia Medica and Therapeutics, but it has taken years of patient enquiry to establish with certainty the therapeutic value of any given remedy. Some new remedies are introduced with a great flourish of trumpets, become fashionable for a time, and then disappear. Others are heralded forth as the great panacea for every ill, but, failing to fulfil the great promises made on their behalf, are cast aside for something else. A few only live to take their place among those remedies which investigation and experience have shown to be of value in the treatment of disease. Notwithstanding the many remedies of tested value in the Pharmacopœia, we may safely say that there are few physicians who prescribe more than from twelve to fifteen or twenty different remedies from one year's end to the other, and of these all would name at least half the list in common. Few physicians care to risk their reputation or the lives of their patients by the employment of remedies which have not been fully tested as to their reliability and value. As a natural result of this, the action of new remedies can only be properly ascertained after experiments, first upon the lower animals, then by their careful and judicious administration to patients in hospitals and infirmaries where their action can be carefully watched by medical assistants and others who have time to devote to such work. And after the remedy has passed through the crucible of experience and experiment it may take its place among others of its class. It, therefore, follows that years must elapse before any remedy can be said to have acquired that character which entitles it to the fullest confidence of the profession. The greatest safety in regard to new remedies seems to lie in what may be

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called "*medical* or *therapeutical conservatism.*" We naturally trust most to old and tried remedies, and are exceedingly cautious, and justly so, in the acceptance of new and untried ones. Not unfrequently it is found that entirely too much is claimed for remedies newly introduced by those especially interested in their introduction, and this circumstance tends in great measure to make thoughtful practitioners justly suspicious of every new remedy. It often happens also that those who attempt to investigate the properties of new remedies are not fitted either by nature or training for such an investigation, hence the wide discrepancy with regard to the action of a given remedy. It is only after years of careful observation that the truth is evolved, and those agents possessed of intrinsic value assume their appropriate places, whilst those that have been shown to be worthless are cast aside. Again, how often do we hear of a certain remedy proving eminently successful in the hands of one medical man, while in the hands of another it has been worse than useless. Now this cannot, in the nature of things, arise from the difference in the action of the remedy in different cases, but is owing either to something faulty in the selection of cases for the trial of the remedy, or to the difference in method and faculties of observation in different individuals.

Without occupying your time with any further remarks in a general way, I propose to pass on at once to the notice of some of the more important new remedies introduced within the past year or two. In doing so, I shall be obliged to be somewhat more brief in the discussion of each remedy than if the merits of some one remedy were alone to be discussed. The first remedy to which I wish to draw your attention is

SALICYLIC ACID.

This substance occurs in the laboratory in the form of a white crystalline powder, free from disagreeable odor, not very soluble in water, and having a slightly acrid and unpleasant taste. As with all new remedies, it has been employed therapeutically in a great variety of diseases; but it is especially with reference to its use in acute rheumatism that I shall allude to it, for if it be found a never-failing remedy for that hitherto intractable disease alone, its value to the world cannot be over-estimated.

Twenty years ago, a celebrated physician being asked what was the best remedy for acute rheumatism, replied, "Six weeks in

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blankets;" and a leading physician in London, England, not many years ago, made the humiliating confession that "medicine had nothing more efficacious to oppose to the course of rheumatic fever than mint water." Then came the experiments of Dr. Garrod in the use of alkalies pushed to the extent of making the urine alkaline, and the alkaline treatment became, and still continues with many, to be the sheet anchor in this affection. Now we have the great virtues of salicylic acid heralded forth as the sovereign remedy, and certainly in many cases it does seem to possess a wonderful power in controlling the disease, and in reducing the high temperature almost invariably present. Dr. McLagan of Dundee was the first to treat rheumatic fever with this remedy. He at first used salicin, an alkaloid which contains salicylic acid. He regarded rheumatic fever as miasmatic in its origin, like ague, and in this way was led (whether rightly or wrongly) to the use of salicin. He found that the salicin stopped the fever within forty-eight hours, reduced the temperature two or three degrees, and changed the course of the malady from that of a disease of six weeks to that of a febricula extending over less than six days. Later on, he began the use of salicylic acid, and tested the two remedies side by side. He found them equally efficacious, but the latter was objected to because of the burning in the throat which it produced. Other observers give salicylic acid the preference, and after having stood the test of a prolonged trial it has come to be generally acknowledged as the best remedy yet found for this painful disease. The *London Lancet* in a recent editorial says: "The very remarkable concensus of opinion as to the value of the salicylates in rheumatic fever is the more important as it comes from those who have the reputation of being slow to adopt new things on account of their novelty, and especially when such men as Sir Wm. Jenner concur in its praise." Those who know how multiple a disease acute rheumatism is, and how variable in its course under any and every treatment, are the slowest to adopt with enthusiasm any new specific in its treatment; but there can be no doubt that salicin and salicylic acid, especially the latter, do exert an influence in its cure which is quite peculiar to them. Salicylic acid has been tried in the Toronto General Hospital by myself and some of my colleagues, and also in private practice, and with almost uniformly good results. Occasionally there are cases to be met with which seem to resist its action, but a considerable relief from pain and a

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lessening of the fever takes place in all cases. No one so far has ventured to explain satisfactorily the *modus operandi* of the remedy, and its efficacy in this disease suggests a very pertinent question, viz.: How can salicylic acid exert a neutralizing effect upon that condition of the blood which constitutes the *materies morbi*? Either the acid theory of the disease or the acid treatment must, it would appear, be wrong, or it may be that some change occurs in the system which will reconcile the two. An interesting field of enquiry yet lies open as to its mode of action, and also as to its value in other acute and chronic febrile diseases. This remedy is also possessed of antiseptic properties, and is used as a local application, being said to equal carbolic acid in efficacy without some of its disagreeable qualities. The strength for local application is from three to six per cent. The dose for internal exhibition varies from two to ten grains. Some give as high as fifteen to twenty grains. It is best to combine it with an alkali, as carbonate of soda or liquor ammoniæ acetatis. A very elegant combination consists of salicylic acid, liquor ammoniæ acetatis in syrup of lemons and water.

Another new remedy which has been introduced of late, and which seems worthy of notice, is

JABORANDI.

This consists of the leaves of a Brazilian plant. It has been used for a long time in South America, and received its first notice from Dr. Langgard in his "Dictionary of Domestic Medicine" in 1865. It was introduced into Paris in 1873 by Dr. Continho, and since then it has received a large share of attention from all sections of the profession. The effect of a full dose of jaborandi is to produce copious perspiration, together with a free flow of saliva, followed by slight lowering of the temperature and an acceleration of the pulse from ten to thirty beats per minute. Robin observes that salivation, perspiration, the augmentation of the lachrymal secretion, and of the nasal and bronchial secretions may be regarded as the primary action of the drug on the secreting organs; but whenever these effects of hypersecretion fail, or undergo material diminution of their intensity, compensatory phenomena are observed in the digestive tube, such as thirst and variable appetite, diarrhœa and vomiting—the latter only occurring when sweating is not established. He says jaborandi should only be administered on an empty stomach, and the saliva which is poured

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out should not be swallowed. Its use is not followed by any injurious after effects—even where debilitated patients have been brought under its influence—and children are less susceptible to its influence than adults. The walls of the arterioles are relaxed by its action, and hence sphygmographic tracings taken before and after its introduction show a marked lowering of the systemic blood pressure. This explains to some extent the readiness with which fluids pass out of the vessels under its use. It is said to be capable of withdrawing one-sixth of the water of the blood, which, if true, would point it out as the remedy *per excellence* in the removal of effused fluid in the system. A writer in the *British Medical Journal* says that, even when it is difficult to produce sweating by the ordinary means, the administration of jaborandi is followed by abundant perspiration. Its therapeutic effect is analogous to the Turkish bath, and is indicated in rheumatism, anasarca, chronic bronchitis, albuminuria, pleuritic effusions, diabetes and fevers of all kinds. In Bright's disease it may be used to relieve the dropsy. Dr. Bruen of Philadelphia (in *Medical Times*) relates several cases in which it was used to great advantage, and says "he knows of no agent which will afford as great relief as this drug." Dr. Craig, in the *Edinburgh Medical Journal*, bears testimony to its value in the removal of pleuritic effusions. He also used it in fevers with a dry tongue, and was enabled by a few small doses to restore the flow of saliva and keep the tongue moist. Dr. Laycock reports two cases in the "*London Lancet*" in which it proved of value in the treatment of diabetes insipidus. In one case the urine declined steadily in fourteen weeks from three hundred to one hundred and twenty ounces in the twenty-four hours, and in the other the urine was reduced in seven weeks from one hundred and fifty-eight to ninety-eight ounces. Dr. Keating of Philadelphia (*Medical Times*, June, '77) who has for some time past carefully studied the action and application of the drug, says "that its chief value lies in its therapeutic properties, and that the necessity for diaphoresis is the indication for its use." He also claims for it another property which he believes is equal in importance to its diaphoretic action, viz., that in *small doses* it contracts or gives tone to the capillaries resembling belladonna in this respect to a certain extent. Owing to the dryness of the throat produced by belladonna, he used jaborandi in small doses to prevent the night sweats of phthisis and found it to answer admirably.

The full dose of the drug is one drachm of the leaves infused in

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three ounces of water, or an equivalent of the fluid extract or tincture. An alkaloid has been extracted from the leaves, named *pilocarpine*. This can be readily obtained in the form of the nitrate of pilocarpine, and may be used hypodermically in doses of one-fifth of a grain. The effects are the same as when the crude is used. Dr. Edes (*Boston Medical and Surgical Journal*) used it recently in a case of Bright's disease, where the infusion of the leaves produced vomiting. The injection subcutaneously of a little more than a fourth of a grain was followed by copious perspiration and abundant flow of saliva. This will be found a most convenient mode of administering this drug, and one which will readily enable the physician to determine its value as a diaphoretic.

EUCALYPTUS GLOBULUS

Is another remedy which has lately been introduced to the notice of the profession. It is a native of Australia, an evergreen of rapid growth, and attaining a very large size, sometimes reaching to four hundred feet in height. It also grows in some parts of the United States. In California a growth of forty feet in height and one foot in diameter has been obtained in four years from the planting. The trunk is tall, straight and limbless, except at the top. The leaves are one inch in width by from four to seven inches in length, and hang in a drooping fashion from the stem. The medicinal property is chiefly obtained from the leaves and flowers, but it is also present in the wood in smaller quantity. The active ingredient is an oily substance termed *eucalyptol*. The antifebrile properties of the eucalyptus were first investigated by Dr. Tristany of Spain in 1871. His investigations were subsequently corroborated by Dr. Brunel of Montevideo and since by leading practitioners in different countries. The tree itself during its life and growth in the soil is found to be invaluable as a prophylactic to those diseases arising from exposure to malaria. Tracts of land that were uninhabitable from miasm, have been reclaimed by planting these trees upon them. This is due, no doubt, in part to the rapid growth of the trees, which must absorb a large quantity of water, and thus serve to dry the soil in which they grow, and also in part to the anti-malarial influence of the balsamic odors which are emitted during growth. The amount of water which a tree is said to absorb every twenty-four hours, is about equal to ten times its own weight. In reference to the influence of the aroma (which is distinctly perceptible in a grove of trees, slightly resemb-

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ling camphor) its anti-malarial effects are manifest in many individuals from simply breathing the air of the groves.

Dr. Logan, of California, wrote that he had given the anti-malarial influences of the eucalyptia fair test upon his own place. He says: "This is cultivated by two Chinese companies; one company lives on the north and the other on the south end of the premises, about three-quarters of a mile apart. The localities both parties inhabit are favorable to the development of malaria, and, as might be expected, they have every year, during the heated term, suffered with malarial fever. Last winter we determined to test the much-vaunted virtues of the eucalyptus. In February we gave to the party at the north end two ounces of seed, with direction that they should be planted near the house. They germinated finely, and produced several thousand of the young plants, but the frost killed most of them. About 1200, however, survived. These, when the heated term had commenced, had attained a height of about two feet, and emitted a strong aromatic or camphorous odor, perceptible at a distance of a hundred yards. In due time the party at the south end were visited by their usual mildly-distressing fever, but up to the present time (about the middle of the season) we have looked in vain for the first symptoms to develop in the other. They are all, to their own astonishment, in robust health. These trees now average more than three feet in height, and the atmosphere of the houses is strongly impregnated with their odor." The doctor then adds that, though carefully searching for hygienic causes, other than the eucalypti, none could be found. He has since planted all of the waste places of his farm with the trees, so firmly does he believe in their anti-malarial virtues.

Unfortunately our climate is too rigorous for the growth of this tree, except in hot-houses. The preparations chiefly in use are the tincture and the fluid extract. The dose of the former is from one to two drachms, and of the latter from fifteen to thirty minims. It has been employed, with varying success, in intermittent and remittent fevers.

Dr. Keller, physician in chief of the Australian Railway Company, reports a number of malarial cases treated with eucalyptus. About seventy per cent. were cured, and the balance required a supplementary course of quinine. On the other hand, he states that it succeeded in a number of cases where quinine had failed. The treatment was generally commenced on the fourth or fifth day after the first paroxysm, and the average duration was nine days, whereas in previous years, when quinine was used, twelve days was the average duration of treatment. It appears from his report that the result is more rapid than when quinine is used, and that when the beneficial effect is not produced in a few days, it is not likely to take place. Many cases were cured by a single dose of the remedy. Other observers confirm the above experience, and a

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number of cases are cited to show that it has succeeded in some obstinate forms of intermittent after quinine and arsenic had failed. In such cases it is important to have a remedy such as eucalyptus is reported to be. It does not cause those distressing head troubles that belong to quinine, and is not so intensely bitter. On the latter account it is to be preferred in the treatment of malarious diseases among children. It has been used with favorable results as an antiseptic and disinfectant. Dr. Woodward of the United States has used it as a disinfecting and antiseptic injection in cases of retained and decomposed placenta, with marked benefit, and Dr. Leary, in the Proceedings of Kings Co. Medical Society, N. Y., reports favorably of its use in gonorrhœa, in which affection he considers it almost a specific. Its antiseptic properties are said to be due to the presence of the oil eucalyptol. Its action on the blood is said to be very similar to quinine in restraining the amœboid movements of the white corpuscles: this would seem to suggest its use in all diseases of a congestive character. There can be no doubt that this remedy is worthy of a more extended trial by the profession.

The next remedy to which I wish to direct your attention is one which has come into use very recently. I allude to

DIALYZED IRON.

This remedy until lately was imported from France and Germany, but it is now manufactured by American chemists. It is prepared by placing a solution of the perchloride of iron in a dialyzer, surrounded with pure water. The chlorine passes through the membrane and is taken up by the water, which is removed as often as necessary until the addition of nitrate of silver shows that no more chlorine is passing. Dr. Wagner, of Vienna, thus describes its properties: It is a thin dark-brown liquid without smell, and slightly astringent to the taste. One ounce contains 1.5 grammes (23 grains) of the oxide of iron, or 1 gramme (15 grains) of metallic iron. It possesses those therapeutic properties which characterize the oxides, and is very effective as an astringent. The points of superiority over the well-known iron preparations are its ease of administration, being nearly tasteless; it does not interfere with digestion, and never produces constipation. It has been successfully employed in all diseases in which iron is indicated. It may be given in the same doses as the ordinary tinc. ferri mur. Becquerel, the celebrated

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French chemist, speaks of it in the most unqualified terms, and it has been used in France for some time with satisfactory results. It has recently been introduced into this country, and has met with the approval of many leading physicians in the United States. Dr. S. Weir Mitchell, of Philadelphia, in a recent clinical lecture, referred to this new remedy, and gave it his unqualified endorsation, especially in cases where the ordinary preparations of iron could not be well borne on the stomach. He gives it in doses of twenty to thirty minims, and in some cases in drachm doses, without producing the least annoyance to the patient. Becquerel also says of it, that it produces no gastric disturbance, no constipation, and never discolours the teeth. Another very important use is as an antidote to poisoning by arsenic. It is claimed to be fully equal to the hydrated peroxide of iron, and has the advantage of always being ready for use. If all that is claimed be true, it is by far the most valuable form in which iron can be administered in many cases.

COCA

Is another of the remedies which has been investigated within the past year. The Erythroxylon coca is a South American shrub, which grows about six feet in height, with bright green leaves and white blossoms, the latter being succeeded by small scarlet berries. It is used by the natives as a mere stimulant. The leaves are chewed, generally in combination with some alkali, such as a little unslaked lime, which they carry in a flask or pouch. A peculiar feeling of increased strength, agility, and impulse to exertion follow its use. It is the first symptom of intoxication, which is quite different, however, from that produced by alcoholics. Dr. Mantegazza, who has experimented considerably with the drug, arrives at the following conclusions:

"The leaves of the coca, chewed or taken in a weak infusion, have a stimulating effect upon the nerves of the stomach, and thereby facilitate digestion very much. In a large dose it increases the animal heat and augments the frequency of the pulse, and consequently of respiration. In a medium dose, three to four drachms of the leaves in infusion, it excites the nervous system in such a manner, that the movements of the muscles are made with greater ease—then it produces a calming effect. Used in a large dose it causes delirium, hallucinations, and finally congestion of the brain.

"The most prominent property of coca, which is hardly to be found in any other remedy, consists in the exalting effect it produces, calling out the power of the organism without leaving afterwards any sign of debility. The coca is in this respect one of the most powerful nervines and analeptics.

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These experiments, as well as the circumstance that the natives have used the coca from the earliest period as a remedy in dyspepsia, flatulency and colic, have induced Dr. Mantegazza, and several of his colleagues in South America and Europe, to employ the leaves of the coca in a variety of cases, partly as masticatory, partly in powder, as infusion, as alcoholico-aqueous extract, in the dose of ten to fifteen grains in pills, and as a clyster. Dr. Mantegazza has used coca with most excellent results in dyspepsia, gastralgia, and entralgia; he employed it not less frequently in cases of great debility following typhus fever, scurvy, anæmic conditions, etc., and in hysteria and hypochondriasis, even if the latter had increased to weariness of life. The coca might also be employed with great benefit in mental diseases where some physicians prescribe opium. Of its sedative effect in spinal irritation, idiopathic convulsions, nervous erethism, the author has fully convinced himself. He proposes its use in the highest dose in cases of hydrophobia and tetanus. It is a popular opinion that coca is a reliable aphrodisiac; he has, however, observed only two cases in which a decided influence upon the sexual system was perceived."

A writer in the *London Lancet*, speaking of the effects of coca on the circulation, said it seemed to be inhibitory as regards the action of the heart. Another correspondent of the *Lancet* stated that while travelling in Bolivia at great altitudes, such as thirteen or fourteen thousand feet above the sea-level, he found great benefit from chewing the leaves. Nearly all travellers in the Andes use this drug as a remedy for those effects on the brain and lungs produced by rarified air. For giving power of resistance to fatigue and inclement weather it has no equal, and is much used for that purpose by the natives of South America. An individual can subsist on much less food when using coca than when without it. It is also said to strengthen the gums and preserve the teeth. Dr. McBean in the *British Medical Journal* refers to the observations of Dr. Ringer, that in all febrile diseases the urea is abnormally increased, owing to tissue metamorphosis, and recommends the use of coca to prevent such increase.

VIBURNUM PRUNIFOLIUM, (Black Hair),

Is another remedy recently brought under the notice of the profession by Dr. Jenks of Detroit in a paper read before the Gynæcological Society of Boston. It is indigenous to this country, and commonly known as the snow-ball bush, from the peculiar character of its clusters of blossoms. The portions which are used in medicine are the bark of the root and the bark of the newly grown twigs. It was first noticed as a therapeutic agent by Dr. Phares, of Newtonia, Miss., in 1866,

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who published an article on its uses in the *Atlanta Medical Journal* in that year. The writer in that paper attaches especial importance to this remedy for the prevention of abortion, whether habitual or otherwise. It gives tone to the system, and prevents those harassing nervous symptoms which wear down the pregnant woman and disqualify her for the parturient effort. He also alludes to the habit, common among negro women on some of the plantations, of taking cotton root to procure abortion, and says that this remedy when given to women who had always managed to miscarry almost invariably succeeded in preventing it. Dr. Jenks has given the remedy a most extended trial in his private and Hospital practice, and bears his unqualified testimony as to its great value in arresting threatened miscarriage. Several other practitioners have had similar experience in its use. Dr. Jenks's mode of administering the drug is to have the patient take from half a teaspoonful to a teaspoonful of this fluid extract four times a day, beginning at least two days before the regular menstrual date, and continuing it two days longer than the usual menstrual period. If the case is urgent, teaspoonful doses may be given every two or three hours. He classes the remedy among the uterine sedatives, and says that its action is as pronounced as is that of ergot in causing uterine contraction. He uses it not only in threatened miscarriage but also in all cases in which a nerve sedative is demanded, in all uterine disorders attended with loss of blood, in menorrhagia, metrorrhagia, depending wholly upon systemic causes, as in phthisis, diseases of the heart, liver, anæmia, or malarial diseases. It is also serviceable in certain forms of dysmenorrhœa, especially when attended with profuse hemorrhage. It renders menstruation much less difficult and painful. It may also be beneficially combined with hyoscyamus, camphor, cannabis indica and conium. The extended experience which Dr. Jenks has had in its use warrants him, he thinks, in speaking confidently in regard to its efficacy in many uterine affections, and he considers it a valuable acquisition to our list of curative agents.

AMYL NITRITE,

A member of the extensive family of hydrocarbons, next comes in for a passing notice. It is a light straw-coloured liquid, having a pear-like odour, and evapourating rapidly. It is administered by inhalation, two or three drops being placed upon a handkerchief

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or the palm of the hand, and is very rapid in its action. It causes dilatation of the smaller arteries, and increase in the heart's action, the pulse sometimes doubling in frequency, the face usually flushes, and there is an appreciable elevation of temperature. Dr. Talfourd Jones, in a paper published not long ago in the *Practitioner*, stated that he believed amyl nitrite would be a valuable agent in cases of over-dosing by chloroform. It has been tried in several cases and found to act admirably in such an emergency, and should always be on hand when chloroform is being administered. If danger surpervene from chloroform, a few drops of amyl should be at once applied to the mouth and nostrils. This agent has also proved serviceable for the much dreaded sea-sickness; a few drops on a handkerchief applied to the nostrils occasionally gives great relief in many cases. It has also been used with marked benefit in warding off attacks of epilepsy when there is the aura or warning before the seizure, also in spasmodic asthma, angina pectoris, and neuralgia.

A new remedy obtained from the ventriculus or gizzard of the domestic fowl, named INGLUVIN, has been highly extolled of late as a remedy for vomiting in pregnancy. Its efficacy has been tested by Prof. Wallace of Jefferson College, Philadelphia, and other medical practitioners in the United States and Canada, and the general testimony seems to be in its favour. It is given in from five to ten grain doses every three or four hours, and may be combined with bismuth and opiates when the latter are indicated. It also facilitates digestion and may be used when the pepsines and pancreatines are likely to be of benefit, but, it is said, with more certainty of good results. If this remedy is as useful as it is said to be, it will indeed prove a blessing to many women who suffer severely from the vomiting of pregnancy. From the statements made regarding its efficacy it appears worthy the attention of the profession.

A substance obtained from petroleum named *Vaseline* has lately been introduced among the list of new remedies. It is a dense oleaginous substance of the appearance and consistence of jelly. It melts at 95° F., is perfectly neutral, without odour or taste and of a light straw colour. The advantages claimed for it are that it does not become rancid under any circumstances, and is, therefore, most valuable as a base for ointments, cerates, and embrocations. It is preferable to sweet oil for preventing surgical instruments from rusting. It is also extensively used as a

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lubricant in the New York Hospitals, for catheter bougies, sounds, and the like. It does not appear to possess any active curative properties in itself, but has been used to soften the hardened crusts in certain skin diseases and as an application to irritable ulcers. Its chief use in medicine is, however, as a lubricant and a basis for unguents and cerates.

There are several other new remedies introduced during the past year, such as the *Grindelia robusta*, said to be a specific for asthma, hay fever, and spasmodic affections, *Xanthium spinosum*, as an antidote for hydrophobia, and *Zerba santa*, as a remedy for gonorrhœa and bronchial affections, but time does not permit a notice of them.

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REPORT UPON CANADIAN MEDICAL LITERATURE OF THE PAST YEAR.

BY

R. P. HOWARD, M.D.,

PROFESSOR OF MEDICINE, MCGILL UNIVERSITY,

CHAIRMAN.

In a new country like ours, with a sparse population as yet so youthful that it is composed chiefly of persons whose grandparents were born in other lands, it perhaps cannot be expected that a medical literature should exist.

Hitherto our professional work has consisted mainly in practising the medical art, and in teaching the science and the practice of that art. But few treatises have been written amongst us upon medical subjects, and not one during the past year. It has not yet become a custom with us to write a monograph during the early years of professional life with the view of getting patients, nor to edit other men's works with additions not derived from personal experience, but expressing the opinions or experience of others, and let us hope these customs may never become Canadian —still, perhaps, more might have been expected from some who have enjoyed large or peculiar opportunities during a long career of public or private practice than they have given to their country in the way of monograph, or treatise, or clinical report.

It is not for us to sit in judgment.

Canadian Medical Literature is confined to that contained in the medical periodicals of the Dominion, of which there are five devoted to the whole field of medical knowledge and two to the department of sanitary science. Of the seven journals, which are all monthlies, one is French in language and the others English.

Looking carefully over the literary work of the year, it may be said that it has been creditable. There have been a good many contributors and not a few valuable contributions.

Amongst the more valuable original papers partaking more or less of the character of monographs may be mentioned, "The Initial Rashes of Small-pox," and "Hemorrhagic Small-pox," by Dr. Osler; "The Climate of Colorado," by Dr. Kennedy; "Pernicious Anœmia," by Drs. Gardner and Osler; "Insanity and Crime," by Dr. Workman; "Remarks on Vaccination," by Wm. H.

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Hingston, M.D.; "Aneurism of the Hepatic Artery," by Dr. George Ross and Dr. Osler; and the "Pathological Report," now in course of publication, by the Morbid Anatomist to the Montreal General Hospital. When this report of 100 autopsies conducted by Dr. Osler with his class is completed, it will form one of the most valuable contributions to Canadian medicine that has yet appeared.

There is a considerable list of meritorious papers, some of them of great interest as illustrations of new or important points in practice; such, for example, are the following: "Sunstroke treated by Quinine" and "Traumatic Tetanus treated by stretching of the sciatic nerve," by Dr. Drake; "Cases of Ulceration and Stricture of the Rectum in which Colotomy was performed," by Dr. Geo. E. Fenwick; "Two cases of Ascites successfully treated with Iodine Injections," by J. P. Ford, M.D.; "A Paper on the Application of Fuming Nitric Acid to the interior of the Uterus," by Dr. Alloway and by Dr. F. W. Campbell, respectively; "Observations on some cases of Injuries and Diseases of the Joints" and an article on "Surgical Shock," by Wm. Fuller, M.D; "Starvation in the treatment of Acute Articular Rheumatism," by C. A. Wood, M.D.

The following group of communications appear meritorious on account of the perspicuity, or felicity, or suggestiveness with which they discuss subjects, some of them obscure, others unsettled, and others not sufficiently studied: 1. "Antiseptic Surgery," by F. LeM. Grassett, M.B., C.M.; 2. "Mal-assimilation in its relation to Idiopathic Arteritis," by H. P. Yeomans, M.D.; 3. "Membranous Dysmenorrhœa," by J. W. Rosebrugh, M.D.; 4. "Quelques notes sur l'Emploi de l'Anesthesie pendant l'accouchement," par le Dr. J. E. Berthelot; 5. "Animal Vaccination," by H. A. Martin, M.D. (of Boston); 6. "La santé et la maladie dans leurs rapports avec les different saisons," par le Dr. Severin Lachapelle. 7. "Notes of Abnormalities observed in the dissecting room," by Dr. Shepherd.

Besides the above contributions there are a goodly number of interesting and instructive *cases* to be found in the literature of the year, amongst which may be mentioned: "Gastric Ulcer with Suppression of Urine for thirty days," by W. B. Geikie, M.D.; "Cancer of Liver simulating Ovarian Tumour," by John Bell, A.M., M.D.; "Case of double Ovarian Cystoma," by C. W. Covernton, M.D.; "Impaction of Gall Stones, and Obstruction of the Bowel," by T. S. Barclay, M.D.; "Two cases of Leucocythemia," by Jas. Stewart, M.D., and R. W. Hurlburt, M.D.; "Case of Suppression of

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the Salivary Secretion," by Donald Baynes, A.M., M.D.; "Removal of Right Half of Thyroid Gland," by W. A. Willoughby, M.D.; "Excision of entire Tongue for Epithelioma by Galvanic Ecraseur," by George Ross, A.M. M.D.; "Separation and Displacement of Superior Maxillary Bones," by J. G. Cranston, M.D.; "Case of Idiopathic Tuberiform Melanosis," by James Cattermole, M.D.; "Excision of the Wrist, and Abscess in shaft of Tibia," by Geo. E. Fenwick, M.D.; "Case of gun-shot injury of the Brain," with recovery, by J. Fife, M.D.; Three cases of Dislocation of the Hip with "Quelque considérations Pratiques, etc.," par le Dr. A. T. Brosseau; "Case of Popliteal Aneurism cured by digital compression and breaking up of the clot," under the care of Dr. Aitkins; "Death from Occlusion and Rupture of Subclavian Vein," reported by Chas. Black, B.A., M.D.; "Tetanus successfully treated with Chloral," by Geo. C. Duncan, M.D.; and many more original contributions of less interest, except to the writers, might be cited.

The "Hospital Reports" regularly furnished by our journals and original translations of German and French papers, lately contributed by several periodicals, form instructive departments of our medical literature.

The two journals devoted to sanitary science are doubtless proving useful, especially in imparting most important information to the laity, amongst whom we believe they have a fair circulation; and in this connection should be mentioned a valuable contribution to the statistics of disease in the city of Montreal, by A. B. LaRocque, M.D., contained in his report of 1876 as one of the health officers of the city. The monthly reports on the "Mortality of Montreal," now being published by the same gentleman, are more valuable contributions to our medical literature than the author himself realizes.

Finally, the editors of our Medical journals deserve the thanks of this Association, not alone as the representatives of Canadian literature, but as cultivators of a taste for medical writing amongst us and as providers of channels through which Canadians may attract the notice of the rest of the Medical world.

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REPORT ON NECROLOGY.

BY

WILLIAM OSLER, M.D.,

PROFESSOR OF INSTITUTES OF MEDICINE, MCGILL UNIVERSITY,

CHAIRMAN.

As chairman of the Committee on Necrology I beg to submit the following report. The number of medical men in the Dominion who have died during the past year is, I am glad to say, small, and among them only two who have occupied prominent places in the profession.

The first of these is JAMES HAMILTON, L.R.C.S. Ed., of West Flamboro', Ont., who died on the 1st of March, 1877, at the age of 80.

He was born at the village of Douglas, in Lanarkshire, in 1797. Receiving a preliminary education at the parish school, he proceeded to Edinburgh as a medical student, and after four years study, obtained, at the early age of 19, the diploma of the College of Surgeons, the date of which is 1816. Thus qualified, and being anxious to see something of the world, he came to Canada as surgeon on a vessel, and was induced by friends to begin practice in Montreal. After enjoying himself for four months, and doing, as he told the writer, very little practice, he returned to Scotland. In 1818 he again visited Canada with the intention of permanently settling, and after visiting many localities, began practice in Ancaster, a small village about 5 miles from the head of Lake Ontario, and, at that time, the chief place of business between York (Toronto) and Niagara. Here, as the only medical man at the head of the lake, he quickly obtained an extensive practice, so extensive, indeed, that the greater part of the day was spent in the saddle. His district at that time lay between the Grand River and twenty miles down the lake on either side, an area about 60 miles by 20. In 1820 he moved across the valley to West Flamboro', about two miles from Ancaster, having purchased one of the most beautiful sites in Western Canada, immediately above the town of Dundas, and overlooking Burlington Bay and Lake Ontario. Here he continued to live until the time of his death. Dr. Hamilton possessed qualities of mind and body which fitted him in the highest degree for his profession, while the strict and conscientious attention which he paid to all cases early secured for him a lucrative practice. Unfortunately in later years he engaged in some commercial enterprises which proved far from successful, but an indomitable energy enabled him not only to tide over reverses, but to make provision for old age. In all public matters Dr. Hamilton took a deep interest, but had no great desire for parliamentary honours. Though a staunch Conservative and a leading man of his party, he was only once

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induced to contest a county, and then unsuccessfully. He was one of the original promoters of the Great Western Railway, of which he was for many years a Director, latterly holding the position of Consulting Surgeon. At the time of the Rebellion he held a commission as Colonel of Militia, and took an active part in its suppression. By his professional brethren Dr. Hamilton was held in the highest esteem, and most deservedly so, for one by one he had heartily welcomed them into his district, holding out to each the hand of good-fellowship. He took a deep interest in the Ontario Medical Council, and represented the Burlington and Home district from 1869 to 1872. It is much to be regretted that Dr. Hamilton has left us no record of his medical experiences, which, extending as they did over a period of sixty years, would have formed a most valuable contribution to Canadian medicine. To the end he maintained an interest in the progress of the art, and would frequently in conversation refer to the great improvements in medicine and surgery. Possessed of an accurate memory stored with interesting incidents both medical and social, he was a most delightful companion and will be greatly missed at friendly gatherings in Wentworth. Till within a year ago Dr. Hamilton enjoyed an unusual measure of health, indeed, in his long career he was only once laid up by illness. From his boyhood he was a most enthusiastic curler, and had been for some time past President of the Ontario branch of the Royal Caledonian Club. For nearly a year before his death symptoms of declining vigour were apparent to his friends, and signs of grave disease of the heart were discovered. The death last year of his son, Dr. Andrew Hamilton, of Melbourne, Que., was felt very keenly by him, and he never fully recovered from the fatigue of a hurried railway journey undertaken at the time. To the end, however, he was cheerful and resigned though loth to depart, and on Christmas Day, when the writer of the present sketch saw him for the last time, and on leaving spoke of his long and honourable career, he replied that nothing would please him better than to exchange his rusty old body for a young and active one, and work on for another eighty years.

The second is JAMES FORREST DEWAR, M.D., Ed., F.R.C.S., Ed., who died on the 8th of August, aged 43. I regret that I have been unable to obtain from his friends the materials suitable for a proper obituary notice. In the early years of this Association he took a lively interest in its proceedings. While in the Ontario Medical Council, he was an active and energetic member, and was, President for the year 1872-73.

The following names have appeared in the obituary columns of the Medical Journals within the year:

J. LOVEKIN, jr., M.D., 1871.
GEO. F. BROWN, æt 28, in Jamaica, of yellow fever.
J. L. BATES, M.D., æt 26, Toronto.
JOSEPH MOORE, M.D., Amherst, N.S.

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C. W. Padfield, M.D., Norwich, Ont.,
Henry Lander, M.R.C.S. Eng., L.S.A., 1837, London, Ont.
Ed. K. Patton, M.D., Montreal, æt 32.
Geo. M. Johnston, M.D., Pictou, N.S.
Robt. Hornby, M.D. Edin., L.R.C.S. Ed., 1833.
John Mitchell, M.D., Merigomish, N.S.
Jacques Beaubien, L.C.P. & S.L.C., 1851, Ottawa.
Dan. S. McColl, M.D., Wallacetown.
Samuel Lewin, M.D., æt 44, Lancaster, Ont.
E. B. Sparham, M.D., Kemptville, æt 58.
John Hostetter, M.D., M.R.C.S. Eng., æt 44, Toronto.
D. Grenier, M.D., Editeur l'Union Médical.

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PAPERS IN MEDICAL SECTION.

ON CRIME AND INSANITY.

BY

JOSEPH WORKMAN, M.D.,

TORONTO.

At the last annual meeting of the Association, held in Toronto, in August, 1876, I was kindly permitted to read a paper on a subject which at that time engaging no small share of public attention, was discussed by various parties with much earnestness. It had been proclaimed by the press, and was re-echoed from the judicial bench, that a criminal epidemic of alarming extent had, for some time, overspread our province, and it was insisted upon by nearly all classes, that the suppression or mitigation of the moral malady was to be attained only by the most rigid and unexceptional infliction of capital punishment.

Though I have not at any time felt convinced that within the period alluded to criminal violence prevailed in such unusual magnitude or intensity as to be entitled to the designation bestowed upon it, I did not feel called upon to controvert the popularized theory.

It is known to the Ontario members of this Association that during last year four men were put on their trials for murder in whose defence the plea of insanity was advanced. Three of these, in whose cases I was concerned as an expert witness, were convicted, and were sentenced to death; but on one only was the sentence carried into effect. The fourth was merely arraigned, and on the evidence of Dr. Dickson was considered by the judge unfit for trial because of mental incompetency. In this man's case the course recommended in my last year's paper was adopted. He was placed in asylum confinement for close observance by reliable experts. He has been now nearly a year under the charge of Dr. Clark, in the Toronto Asylum, and I understand from this gentleman that his report on the man's mental condition, sent in

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to Government two or three months ago, firmly sustains the opinion expressed by Dr. Dickson, and justifies the course taken by the judge.

I cannot but regard the procedure in this case as a very laudable deviation from the stereotyped system of former years, and I am convinced that, not only the Law Officers of the Crown, but the entire Bench of Justice, will feel thankful for the salutary and rational precedent thus placed on authoritative record. As I have before said, three of the four alluded to were condemned. The evidence in two of the cases abundantly satisfied me of the insanity of the persons, and as to that given in the third, it certainly merited more skilled consideration than the jury were capable of bestowing on it. The crimes of the first two were very atrocious, and that of the third appeared to have been so reckless and wanton as to call for deterrent chastisement. It is well understood by all who now hear me, that the above elements of offence are too shocking to the minds of ordinary men, who have never bestowed careful study on the subject of mental disease, or have not had opportunity for observing it in its manifold and very diversified forms and degrees, to permit of their taking a rational and calm view of any case in which they are presented. The two who were not executed had their sentences commuted to imprisonment for life in the Provincial Penitentiary. One, the more atrocious murderer of the two, was forthwith removed to the Rockwood Asylum, and placed under charge of Dr. Dickson. He died within six months. Dr. Dickson has informed me that in the asylum he gave decisive indications of insanity, and the *post-mortem* examination of the brain, made by Dr. Dickson and three other eminent physicians, clearly showed that this organ had been in a diseased condition for a considerable time past. The second convict also died about three months after entering the Penitentiary. I exceedingly regretted that no *post-mortem* was held, but the Penitentiary surgeon, Dr. Lavell, has stated to me that the man in his final illness showed unmistakable symptoms of brain disease. He lay in a comatose state for two days before death; and it was Dr. Lavell's belief that cerebral effusion had occurred.

I have seldom seen a person of so defective organization. His head was notably unsymmetrical, and I never saw the pigeon breast so prominently displayed as it was in him. The heart sounds indicated serious valvular trouble, and it was my belief

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that the organ was considerably misplaced. Dr. Bucke and I testified pointedly to these facts, and we were sustained in our testimony by a medical witness who was sent by the Crown to watch the case, or, as I believed, to watch us. Strange to say, this gentleman's testimony went even further than mine in support of the plea of mental defect. He, however, escaped the lash of the erudite *Globe;* but Dr. Bucke was doomed to share with me the infliction of a full measure of that organ's classic slang.

In my last year's paper the following passage occurred near the conclusion, which, in connection with the preceding details, I may not inappropriately reproduce here: "Time is the grand revealer of all secrets, the infallible expounder of all mysteries, the potent settler of all doubts. If, instead of rushing on the trials of some atrocious offenders at lightning speed, and consigning to the gallows and the quick-limed grave the momentous question of their moral responsibility, we should, in cases in which medical opinion suggests the probability of mental unsoundness, place the accused under close and skilled observance for a sufficient period, justice would neither be cheated nor outraged, law would be divested of much of its indocility and barbarity, and public sentiment would become more rational and authoritative."

Time *has*, assuredly, revealed the momentous secret in the cases of Ward and young Alden; and time, I am convinced, would have amply revealed it in McConnell's case; nay, indeed, time *did*, though not *timously*, reveal it, for the evidence given by the jail surgeon as to this unhappy man's mental and physical condition, in the interval between his conviction and his execution, and as to the lesions observed on his brain, in the *post-mortem* examination, could not fail to satisfy any person familiar with the phenomena of insanity and with the appearance of the brains of its victims, that he must, for a considerable time, have laboured under very serious mental aberrations. I have been favoured with the section of that part of his skull on which a fracture had been inflicted some two or three years before he murdered Mr. Mills. I put it to any person who is well read in the literature of insanity, whether such an injury as is indicated by the appearance, both external and internal, of the piece of skull which I now present for your inspection, was not very likely to be followed, sooner or later, by formidable mental alienation. I could quote dozens of authorities confirmative of this belief, and

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I may be held excusable in adding that my own twenty-two years' close and careful observance has been thoroughly confirmative of the correctness of the views expressed by the numerous eminent writers whose works have come within my perusal.

And now, gentlemen, I have a rather ludicrous, though not uninstructive incident, in connection with poor McConnell's skull to narrate to you. In November last I had, by the politeness of the Sheriff of Wentworth, the privilege of examining a plaster cast of the head of McConnell, said to have been taken immediately after the body was cut down,—would you believe it, this cast showed not a trace of the fracture, though the ridge was so distinctly visible during life that I was able, in the Court-house at a distance of 25 or 30 feet, to see it and to point it out to the jury! I leave it to those experienced in the taking of such casts to guess how the one exhibited to me became so nicely smoothed down over the region which, above all others, should have been faithfully represented. The inspection explained to me one fact which had previously failed to be comprehended by me. I had learned that a certain chatty medical gentleman professed to several persons that he had seen McConnell's skull, and that it showed no mark of fracture. As I deemed it polite not to impugn the veracity of this critic, my charitable conclusion was that he had seen only the smoothed-down plaster cast, though even this interpretation involved the rather unpleasant suggestion of too large an economy of truth.

The hanging of McConnell, we were told by the newspaper philosophers, was indispensable to the safety of society; and more than one of these public guardians taught that no distinction should be made between sane and insane offenders. In their opinion the best, if not the only reliable, preventive of murder, was the extermination of all murderers. Whether in compliance with their clamourous demands, or from other more rational considerations, the sentence was ordered to be carried out, and McConnell was scientifically hanged. Mark what followed his doom, in hot haste! Ward killed his wife, and burned her body in the conflagration of his own house, very severely scorching himself; Hopkins, at Lynden, murdered his wife in broad daylight, and instantly made known the fact of her death to the men working for him, at a little distance from his house; the two Youngs murdered McDonald. These three murders were perpetrated a few miles from Hamilton. Next, young Alden shot Jefferson in

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Hamilton a few months later; and a short time ago Johnson made a murderous attack in daylight on Miss Kneller, in the same city, almost faithfully imitating the slaying of Mr. Mills by McConnell. Whatever other moral effect may have been produced by the execution of this man, it surely did not prove suppressive of the crime of murder in Hamilton or its vicinity.

Johnson is alleged to be insane. He was once committed as a criminal lunatic to the Rockwood Asylum, from which he effected his escape. I can not avoid the belief that his ferocious attack on Miss Kneller was intended by him as a dramatic reproduction of the Mills butchery.

Nothing can be less consistent with established facts, than the belief that capital punishment of either the sane or the insane deters the *latter* class from the perpetration of similar offences; and many thoughtful persons doubt its salutary influence over the *sane* class. But these are questions which concern not our profession. As expert witnesses we have nothing to do with the requirements or the course of the *law*. Responsibility for the character and the operation of our enactments rests not upon us, but upon our legislators; our sole function is, when placed in the witness stand, to declare, to the best of our belief, the bare truth, whether that may benefit or injure the party on whose side we may have been summoned.

If the law could exactly define the *degree* of mental unsoundness which is compatible with full moral responsibility, a very great difficulty would be removed from the process of its administration. The degrees as well as the forms of insanity are of almost infinite variety, and I should hesitate to say that every degree or form of mental defect, however trivial or shadowy, should exempt its subject from all responsibility for his evil acts. I have had conversations with some asylum inmates who have told me that the law could not touch *them*, and therefore they might with safety commit any offence they pleased. My reply was, if you are capable of thus reasoning on your actions and of coolly deciding on their performance, you have the power of abstaining from crime, and, should you indulge in any wicked act, I shall be able to give evidence that will convict you, and so my advice is that you behave decently and peaceably. This admonition I generally found sufficient to secure my object.

But the class of insane offenders usually presented in courts of justice will be found to include very few who have calculated on

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immunity from punishment because of their mental unsoundness. On the contrary, the really insane offender usually repudiates the allegation of his lunacy, asserts his own clearness of head, and not unfrequently tells his questioner that it is he who is a fool for regarding him as such.

In cases of palpable and unequivocal insanity, but little difficulty is encountered either by judges or juries; but insanity does not always, nor constantly, present itself in its full life form and altitude, and to those who have not lived in close neighbourhood with it, and witnessed its strange alternations and puzzling incongruities, the formation of a decided opinion must often be a matter of great difficulty. I doubt not that many of you have, at times, found it very difficult to formulate an ordinary certificate of lunacy for commitment to an asylum of persons of whose mental alienation you have not had a shadow of doubt. Now, to have to enter a witness-box, and give, in connection with such undemonstrative cases, that detail of facts ascertained in your personal examination of the patients which will meet the requirements of the law, or withstand the strategic assailments of a crafty cross-examining advocate, is certainly no enviable position. I have, in my time, admitted into asylum custody hundreds of lunatics, the medical certificates of whose insanity were defective in the above relation; and yet I can hardly charge my memory with more than one instance in which my subsequent observance failed to ratify the decision of the medical examiners; and that one was a case of the most clever simulation I have ever seen, or read of, so that I heartily exonerated the examining physicians from all blame.

If I have not already trespassed too far on your time and forbearance, I would here narrate the details of a couple of cases, which, for a long time, were to me perfect puzzles. You will, doubtless, not be unprepared to hear that the subjects were of the softer sex.

The first was a young woman under 15 years of age. The details furnished in the medical certificate, and supplemented by those of her friends, were by no means meagre, so far as the moral abnormalities of the patient were concerned. She was presented to me by her mother, who exhibited a bagful of various articles of dress which the girl had destroyed, by cutting out numerous pieces, mostly circular. A long detail of other very wanton misdeeds was added. I was led to the conclusion that we were about

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to encounter a very mischievous and annoying inmate; but I resolved to treat her trustingly and kindly, and to await the result. I was not disappointed in my hopes. She not only never misbehaved, but was really a model of good conduct. We found her to be obliging, kind, obedient, and very intelligent; not by a single act or word did she exhibit a trace of insanity from her admission in December until her discharge in April following, when she was taken home by her mother. No sooner had she re-entered under the paternal roof than she repeated on even a larger scale her former misdeeds, and on the third day after her departure from the asylum, her mother once more presented her. I declined to re-admit her, stating that I had not found her to be insane, and could not feel justified in receiving her. The mother then fell into a pitiable state of commotion, which vanquished me, and I agreed, that if she would take her daughter back with her and submit her to proper medical examination by three physicians who should testify to her lunacy, I would defer to their finding and again admit her. Two days after she returned with the required document, in which the girl was designated "a monomaniac with the propensity to destruction of property."

I am very certain that besides this "propensity," no other evidence of insanity was obtainable. So far from there being any lesion or defect of intellect, we had found the very contrary to be the fact. I resolved to treat her in just the same manner as before. I retained her nearly thirteen months, and she behaved in every way to my entire satisfaction, and became a favourite with us all both sane and insane. Towards the end of her second residence, I took several opportunities of conversing with her kindly but admonitorily, telling her she was not insane, and that she ought to know that continuing as an asylum resident must blight all her womanly hopes of future well-being, and inflict on her parents and brothers, who had all been extremely kind to her, unspeakable distress. I concluded by intimating to her, that, in the event of another exhibition of her evil doing, she must make up her mind to confinement in a prison or reformatory, and not in an insane asylum, and that she would find a very painful difference between the lenity of discipline in the latter and the correctional rigidity of the former. She ultimately intimated to me that she would willingly leave the asylum, but not to go home to live with her mother, against whom she evidently indulged a very unfilial feeling.

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I apprised her mother of this decision, and she made arrangements for her daughter's new residence with a new form of daily employment, and took her out of the asylum on a second trial. Three years afterwards I had the pleasure of learning that she had gone on well, and still later she paid us a visit. It is now fourteen years since she went from under my care, and I have had no unpleasant report of her.

Here, then, was a case, if there ever was one, of moral mania, pure and simple. There was, so far as I could discern, no defect or impairment of intellect, but yet dare we say that *all* the realm of mind was in a state of integrity? Was the unnatural aversion to a kind mother an indication of perfect sanity? Is it not an almost universal fact that insanity presents, as its earliest manifestations, unaccountable likings and dislikings, and that the objects of the latter are invariably those who were previously most loved? This consideration gave me pause, and constrained me to entertain a charitable view of the case. It also dictated to me the course of moral treatment to be pursued; and who will say that my decision was unwise or unjust? Suppose I had adopted a sterner course and treated her not as a victim of mental alienation but as a deliberate criminal. should we have found her the amiable, docile patient she proved to be? Is it not far more probable that we should have rushed into premature development a mental malignity over which subsequent kindness might have entirely lost its healing power?

Do not, I entreat you, regard these words as a mere lapsus of vague sentimentalism. I have before said in relation to other cases which to superficial and inexperienced observers presented an aspect very different from their latent reality, that "time is the grand revealer of all secrets, and the potent settler of all doubts."

Insanity is, surely, in its every form a deep mystery, and it behooves us to keep our eyes open to every flicker of light which may be shed on its gloomy domain. It consists with the experience of all physicians, that, in the incubative stages of some diseases when the determination of a clear diagnosis, after the most patient and exhaustive exploration of existing physical signs, is frequently unattainable, and its precipitate enunciation might be alike imprudent and erroneous, a cautious enquiry into the family, or stock, history of our consultant may throw in a side-light on the case, which either dispels our apprehensions, or darkly beglooms them.

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In no human malady is this form of enquiry of more value in relation both to diagnosis and prognosis than in insanity. It was not till seven years after the so-called moral monomaniac, of whose case I have been giving a few details, had a second time left me, in a state of at least much doubtfulness as to her actual mental constitution, that a *side-light* was thrown upon it which convinced me that in treating her, not as a moral criminal, but as the innocent subject of a germinal mental disease, our charitable interpretation of her conduct had guided us into the path of true science.

At this time an older sister, whose history was a truly sad one, was committed to my care. Of the early phases of her insanity I gathered but little. She had, some years before, eloped from her good home and fallen into a life of abandonment. Ultimately she became an inmate of the insane department of a large almshouse in one of the chief American cities. Her parents accidentally discovered her whereabouts and brought her home,—alike in body and mind an utter wreck. Now it was that I first understood the words of the mother when she brought back my first patient, and I declined to re-admit her, under the belief that she was not a fit subject for asylum detention. "Oh, then," said she "what *will* become of her? She will go to the streets, and be lost." Had she then given me but a ray of that *side-light* which maternal delicacy constrained her to withhold, I might have responded very differently to her entreaties.

My second patient from the family has died since I relinquished my asylum position. My first is, so far as I am now aware, in good health of mind and body; but just as no mortal's epitaph should be committed to marble before the curtain of life's drama has dropped, so must we wait and watch for the final issue of this and all similar perplexing cases.

I find, gentlemen, that I have taken up too much of that time which must be more appropriately devoted to other subjects, in closer affinity to the legitimate proceedings of this Association, to warrant my entering upon similar lengthy details of the second case alluded to by me in the outset. Suffice it to say, that both were to me deeply interesting; and one was, perhaps, more instructive than it may since have proved to others who have concentrated their observance on its individual manifestations, to the exclusion of those auxiliary irradiations which are occasionally contributed from the side-lights. The case has, throughout, pre-

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sented those characteristics which in all our ablest writers on insanity, go to make up the motley garb of moral mania; and now three times over the lady has been duly certified to be the subject of this form of mental alienation, by medical examiners of established high reputation. I dare not venture to say that in this lady I ever detected any flaw of intellect, yet were I to furnish you with even a small moiety of the details of her home life, or of her asylum exhibitions, I feel assured you would hesitate to declare to her perfect sanity. I had her many years under my observance. I had certain conjectures as to the probability of a morbid heredity, but until very near the end of my official relation to her no clear side-light had broken in. Then I learned of a cousin being insane. This person is now an asylum co-inmate with my quondam friend.

My object, in laying before this Association the preceding hurriedly-recalled observances has been to impress upon society, through your instructing and influential agency, the very great importance, in the determination of the actual mental condition of some moral delinquents, of a wide and penetrating circumspection over the entire range of those facts which a thorough acquaintance with morbid psychology will have taught you to estimate at their true value. Among these facts none can more potently command deference than morbid heredity; and yet, in utter defiance of this long-established truth, what do we find is the orthodox practical creed of our courts of law or equity? Do not the judges, in their charges, scrupulously abstain from the utterance of a word which might lead juries to allow this element, however clearly established, to enter into their consideration, or in the most remote degree to influence their findings? I have, again and again, been pained by observing this conservative indocility; and I have said to myself, why should we severely animadvert on a Chief Justice Hale, sentencing two old women to be burned as witches a long time ago and in his charge to the jury very learnedly descanting on the actuality and the abominations of witchdom, when, to-day, we find his bench worshippers ignoring a medical fact which has passed into an acknowledged tenet, not only of scientific doctrine, but of universal popular conviction? What should we say of the physician who might, in the examination of a person alleged by his friends to be insane, fail in a conversation of an hour, or in several conversations with him, to detect any striking indication of insanity, and who, resting his

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decision on this evidence alone, in exclusion of the most ample proofs of insanity running through the stock for several generations, and, under the observance of credible and disinterested informers, having shown several out-croppings in the present subject, should yet unhesitatingly declare him free from mental flaw, and consequently a thoroughly responsible free-will moral agent? Should we not say of such a Doctor, that he has yet much to learn?

Yet just such is the position of the judge on the bench, who ignores all consideration of similar facts, and tells the jury they are not to enter into the history of the prisoner's antecedents or of his collateral blood relatives, but must form their judgment as to his general mental condition upon the evidence bearing upon this question at the time of the offence, however imperfect and undeserving of scientific deference this may have been.

About fourteen years ago, when on a visit to this city, I chanced to be requested by an esteemed medical friend to examine a gentleman under legal interdiction, in order to qualify myself for going into court to testify to his persistent mental unsoundness. I complied with my friend's request, and had a long interview with the interested person in which I failed to elicit in conversation any words that, if detailed in court, would be interpreted as indicative of mental unsoundness; and yet I was as sure of his insanity as of my own existence, for I had long been aware of it, and was satisfied that his friends had no improper motive in seeking to restrain him from squandering his estate. I need not say that I declined appearing, and that the case was more rationally disposed of without my testimony than it would have been with it, for I know too well the adroitness with which a sharp cross-examining counsel can contrive to turn into ridicule the evidence of a defectively informed medical witness, and how heartily the gentlemen of the long robe rejoice in the torture of our profession.

Under your further kind indulgence I would now bring under consideration the details of a very interesting case of insane homicide, as I have found them furnished in the report of the trial, published in the columns of the London *Mail* of 9th February last. I shall not detain you with the reading of the whole evidence, but merely with such portions of it as have appeared to me to throw clear light on the important question of the prisoner's mental condition.

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"THE PIMLICO MURDER."

Frederick Treadaway, 20, described as a shopman, was indicted for the wilful murder of one John Collins.

The prisoner, a good-looking young man, pleaded "Not Guilty."

Mr. Straight, with whom was Mr. Avory, conducted the prosecution, which had been instituted by the Treasury authorities; Mr. Besley, assisted by Mr. Tickell, defended the prisoner.

Mr. Straight, in opening the case for the prosecution, dwelt on the solemnity of the occasion, which demanded, he said, from the jury the strictest attention and the utmost care. The learned counsel then stated all the attendant circumstances as they were afterwards, to a considerable extent, related in evidence.

The first witness called for the prosecution was Elizabeth Collins, who, being examined by Mr. Avory, said,—I live in Stanley-street, Pimlico, and am the widow of the deceased. I have known the prisoner over 12 months. I first saw him in the Harrow-road, talking to my niece, Carry Stephens, and she introduced him to me. I saw him twice after that at Mrs. Stephens's. He came to our house in October last to fetch a hamper, and took it away with him in a "trap." That was the first time Mr. Collins saw him, and he stayed about half an hour. Mr. Collins and he talked together some time. The prisoner again came on the 14th of December shortly before 1 o'clock. I let him in. After wishing me good morning, he asked if Celina was there, meaning a niece of Mr. Collins and a sister of Carry Stephens. I knew he and Carry kept company. He said he had a letter from her to meet her at 1 o'clock. Mr. Collins was then at home, and asked him to dinner, which was served in the front kitchen. The prisoner marked some new linen for me on that occasion. He stayed to dinner with Mr. Collins and me. He then wrote a letter, and I told him I was going to Paddington. I left to do so about 4 o'clock, leaving the prisoner there with Mr. Collins. They were then talking very comfortably together. I returned about a quarter to 11 that same evening. The prisoner had then gone. Mr. Collins was waiting my return at the front gate. I saw the prisoner next morning. He came to our house about half-past 10, and I let him in by the area door. He asked if Mr. Collins was in. I said he was not. The prisoner said he was very tired, and I asked him to take a seat in Mr. Collins' easy-chair, which he did. I asked him if he had the letter in his pocket. He said "No, I have not been home all night; I have been walking about." I said he must be very tired, and gave him a cushion for his back. He asked how the Stephenses all were. I said they were very well, except Mrs. Stephens. Mr. Collins came in about 11 o'clock, and went into the front kitchen. I went about the dinner, and left the room. They were then talking together in an ordinary way. I did not hear what they were talking about. I went in and out repeatedly, as I was cooking the dinner in the room in which they were. Dinner was ready about half-past 1, and the prisoner stayed and had some. When I left the kitchen the prisoner was still sitting in the arm-chair. I went into the kitchen and made a pudding. I could not say whether the prisoner ate any dinner or not. When I returned he was still

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sitting in the arm-chair, and Mr. Collins had then moved to a different position. They were still near together. I cleared away all the dinner things and went into the back kitchen, and backwards and forwards a good many times. The prisoner and Mr. Collins were still in the kitchen talking together. Once when I went in the prisoner was looking at a fiddle, and he hung it up again. The last time I saw them together there was only the table between them, and the prisoner was standing with his hat in his hand, as if he were going away. Mr. Collins was still sitting in the chair. Up to that time they had only talked together in an ordinary way. I went to the back kitchen for a pan and heard a loud report. I turned round to go and see what it was, and I met the prisoner in the doorway of the back kitchen, coming towards me. That was not his way out. I asked him what the report meant. He said he did not know. The words were scarcely uttered when he fired again. I saw the flash and then heard the report, which was that of a heavy blow. It struck me in the ear, and I felt the blood trickling down my neck. I reeled round, but did not fall. I saw the prisoner go along the passage to the area door. I could not say if he had his hat on. I went after him and caught him by the coat at the area door. I attempted to cry "Murder," upon which he put his fingers into my mouth so that I could not speak, and with the other hand took me by the neck and threw me down outside the area door. He beat my head on the pavement several times. I struggled hard for life as he leant upon me, and I loosed one of my hands, but he still held me. As he was leaning over me, I took him by his shirt. I then found I was regaining my feet, upon which he released me and went up the area steps rather quickly; at least, it seemed quick to me. I put my other hand on the floor and tried to get up, but found it in a pool of blood. I went up the area steps and begged the passers-by to send for a doctor, and a policeman to take the prisoner into custody, saying he had murdered my husband. On my going into the kitchen I said to my husband, "What has he done; has he shot you?" He made no reply. He was then lying on the oil-cloth of the kitchen floor, and I knelt over him and begged him to speak to me, but he was gone; I felt he was dead. The only sign of life I saw was a slight quivering of the lip; and my only hope in life was gone. No one was in the house at that time but an aged lady in bed. We had a gentleman lodger, but he did not come home until 6 in the evening. I had no children. Mrs. Stephens was Mr. Collins's sister, and Mr. Stephens was a ladder-maker. My husband was formerly a builder, and had some house property. He kept his money upstairs as a rule, except when there was any large amount, and that was in the room in which we slept. Mr. Stephens wore a belt for a weak back, and he made some use of it when he went into Cornwall for carrying his money, and then only.

Chief Inspector Thomas Foinet spoke to having been at the Isleworth Police Station shortly after 12 o'clock, when the prisoner was taken there. The prisoner had then only been charged with the murder of Mr. Collins, and witness told him he would be further charged with the attempted murder of Mrs. Collins. The prisoner then appeared quite stupefied. At length he said, "I don't know how I came to do it. It seems a blank to me."

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Afterwards, on the way to London, witness asked him where he had got the revolver. He replied, he had bought it on Thursday morning, shortly after leaving home, at a shop in the Seven Sisters'-road, and he intended to use it on or for himself. Things, he said, were very miserable at home, and he did not know what he was doing. He added that after the affair he went to Hyde Park and thence to Kentish-town; that he had been out the previous night from 5 in the morning, and he felt tired. Next morning he said on leaving Kentish-town he did not know where he was going or what he was doing; he only had 2d., with a penny of which he bought a newspaper to read about "the affair." It was all wrong, he said, and he explained how wrong. He afterwards went through Finchley and Barnet towards St. Alban's, but afterwards retraced his steps towards London, thinking he should like to see Mrs. Wiggins once more; that on reaching Kentish-town he found a pair of spectacles, which he wore as he went through Kensington and Hammersmith. On reaching the police-station he was placed in a cell, and on the Sunday evening he asked witness for pen, ink, and paper to write a letter. He was told he could have them, but that witness would read what he wrote before sending the letter. He said he only wanted to explain to Mrs. Milton why he shaved off his whiskers at her house, as that had seemed to surprise her. Witness offered to send for her, but the prisoner afterwards changed his mind, and no letter was written. Later on he said to witness, in the presence of his father, "I don't know how I came to do it. I don't think I did do it. I must have been mad at the time." On the occasion in question, when the prisoner was at the station, he seemed to be partially stupefied. Witness was satisfied that there had been no theft or attempted theft.

At this stage of the trial the prisoner was taken ill in the dock, and Mr. Gibson, the prison surgeon, having been called to see him, intimated to the Court that he was not in a state to justify the further continuance of the trial that day. He added that he had had him under his charge since the 15th of January, and nothing of the kind had happened before.

Mr. Justice Lush thereupon adjourned the trial.

Sarah Vivian was called as a witness, and examined by Mr. Tickell. She said her maiden name was Treadaway, and she was the sister of George Treadaway, the prisoner's grandfather. She remembered her father and mother very well. They lived near Uxbridge. Her mother died at 55 years of age. Her brain was paralyzed for three years before her death, and she was quite childish. Witness's father died at the age of 82; 25 years ago. She knew all the family well. Her mother's maiden name was Weedon, and she (the mother) had two brothers, one of whom was named Charles and the other Samuel. Her sister was named Lucy; she married a Mr. Stillwell, by whom she had two daughters; one of them was Mary, who died in an asylum—that of Hanwell. She was between 50 and 60 years of age when she died, and had been in that asylum about 15 months. Samuel was imbecile two or three years before his death, and tried twice to drown himself. He was between 60 and 70. Her mother's brother, Charles Weedon, was in St. Luke's Lunatic Asylum three or four years, and afterwards had

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a keeper until his death. He was near 70 when he died. She had a sister called Mary Treadaway, who married a Mr. Chapineau, and who was about 45 when she died. She was strange in her manner and quite childish. She was not in an asylum. She lived in the Marquis of Exeter's park. Witness's brother William died in 1853 or 5 at the age of about 55. He hanged him self. He had a good deal of property and was very well off, but was given to despondency. Witness had a sister, the prisoner's grandmother, who died about two years before the prisoner's birth. Her age was about 57 or 60. She was quite insane, and obliged to have a person always with her. Witness had a brother named Henry who died in a fit when he was eight years old. Susan, a daughter of her brother George, was always subject to fits, and she died in one at the age of 22. She had the first fit in Paddington churchyard; and once she fell on the fire in a fit. They were called epileptic fits.

By Mr. Straight, in cross-examination,—The age of Charles Weedon when at St. Luke's and when he died was near 70.

George Hibbert proved that he acted as keeper for a year and nine months to Charles Weedon, who, though insane, was not a violent person.

Mrs. Ann Henn, residing at Notting-hill, said she was for some years in the service of the prisoner's grandfather as cook—about 23 or 24 years ago. His first wife was then living, and his son George and his daughter Susan were living in the house unmarried. Susan was subject to fits, which occurred frequently and used to last an hour. She had them once or twice a week all the time witness was there. She struggled very much when in the fits and became quite black in the face. She was also very violent on those occasions, and it required witness and her father to keep her down. She used to bite pieces out of the glass from which she drank. She was very strange in her eyes and manner, and witness could tell by that when the fits were coming on. She complained of pains in the head—shooting pains. She was always very ill after a fit, which would sometimes last an hour, and for days afterwards she looked haggard and wild about the eyes. She was not at all conscious when in a fit, and she used to foam very much at the mouth. Her mother was a very great invalid; and she, too, was very "curious" about the head, and used to throw things at witness—one being a coal-scuttle. She was exceedingly passionate. She had a brother a very weakly boy.

George Frederick Treadaway was the next witness. He said,—I am an outfitter, and the accused is my son. He is 21 this month. In infancy he was brought up in the country, and afterwards lived with me in the Harrow-road, going to school till he was 15. He was brought up to my business, and was of a kind, gentle disposition. In July or August, 1875, I remember him coming home on a Saturday and walking with him in the Holloway-road on the Sunday morning. We were on the left side of the way and approaching the Liverpool-road when I felt him stagger against me. I asked him what was the matter. He said something which I did not understand, and I noticed his eyes appearing as if the sight was gone. He fainted and lost all muscular power. I dragged him into a doorway and rubbed his

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back and opened and rubbed his hands. He seemed quite unconscious of what I was doing, but did not seem to speak. He remained in that state nearly twenty minutes, trembled very much, and shook violently, turned quite pale, and then afterwards gradually recovered. The first words he said to me were, "I'm burning in the throat; give me something to drink." I could not get him anything to drink, but he sucked two oranges which I had, and he seemed to recover. We rested under the railway bridge on the way home, he being then very weak. When we got home he complained of being very bad in the head. Once he came home, saying he had had a fit in a doctor's shop. He had then a graze on his face. That was in 1873, and he complained of his head all the day afterwards. In September, 1876, he left his situation, and he frequently complained of giddiness in the head. The last few weeks in December he complained of pains in the head. He was generally very much dispirited and distressed, and sometimes would not speak for an hour. I had had no quarrel with him. My mother's maiden name was Susannah Bourne; she died in 1854, at the age of 56 or 57. She was always ill, and at times used to throw things out of the window at people passing, imagining they were making fun of her. She was also guilty of acts of violence at times.

Mrs. Caroline Treadaway, the mother of the prisoner, said he was the oldest of nine children. Her eldest daughter had brain fever, and was ill for about six months. He had frequently said he was miserable, and on one occasion talked of committing suicide.

Angus Caroline Treadaway, daughter of the last witness, gave corroborative evidence, tending to show that her brother had been of late in a very desponding state of mind, and had said the best thing he could do was to shoot himself.

Caroline Stephens said the last occasion she saw the prisoner was on the Saturday before he went to Pimlico. She had met him by appointment at the house of a relation on the Saturday evening. He parted from her in the usual way, and there had been no quarrel between them at all.

Dr. Hughes Bennet deposed that in the course of his practice he had seen persons afflicted with epilepsy, and he explained the difference between that and epileptic vertigo. The milder form of epileptic vertigo, he said, could exist without the patients' knowledge. In that form it did not necessarily recur. Very frequently epileptic fits followed epileptic vertigo. A person having epileptic vertigo might not know it. Epileptic vertigo was transmissible. He had seen instances of persons acting automatically under epileptic vertigo, and one of which he gave in detail from his own experience. On one occasion he extracted a pint of opium from a man who was afterwards unaware what he had done. Epileptic vertigo was not a recognized form of mental derangement. Witness had seen the prisoner on five occasions, and during those visits he did not discover any unhealthy condition. He questioned him as to his past health, and he said he had been in good health until about two years ago, when about that time he had a fainting fit in a chemist's shop, and that since then he had had six or eight seizures of a similar kind; and, in addition to those, he had been subject to

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very frequent and violent headaches, and had been liable to various pains; that especially since August last he had been in a very depressed and melancholy condition, and, while brooding over his troubles, he conceived the idea of committing suicide, eventually coming to the conclusion that he would have recourse to a pistol. He spoke on the morning in question of giddiness in the head, and of a black cloud coming over him. These statements came out in the course of conversations of witness with the prisoner, and he did not in any way suggest the answers to his questions. The result of all those symptoms suggested to witness the existence of epileptic vertigo, the 3rd of February being the last time he saw him. He saw him after the attack yesterday, which, witness thought, was of an epileptic character, though somewhat more prolonged than usual. He attested the symptoms in the presence of Mr. Gibson, the prison surgeon. Angina pectoris was very frequently a sign of epilepsy.

Mr. Justice Lush said, incidentally, that the state of mind in which the prisoner was when he committed the offence was the question for the jury.

The witness, replying to the Court, said he had never seen epileptic vertigo last more than three or four minutes, but the effects might last from a few seconds to a few hours.

By Mr. Straight.—There was nothing in the circumstances inconsistent with an ordinary fainting fit.

Dr. Reece Williams, Resident Physician at Bethlehem Royal Hospital, and lecturer on mental diseases at St. Thomas's Hospital, said he had seen many cases of epilepsy in his experience. The medical profession certainly recognized epileptic vertigo as a form of mental disease, and he gave instances which had come under his personal observation; one in particular, in which a patient on recovery could give no account of his symptoms. He related the circumstances attending one remarkable case of this kind, and said he had seen other persons attacked with epileptic vertigo and unconsciousness of what they were doing. All that such persons did was automatically; they were mere machines for the time, and after the attack there was an impression on their minds as to something they had done, but they could not tell what. The length of the attack varied. The longest attack he had seen lasted about an hour; but, as a rule, they were very much shorter. During the time the patients were unconscious. The circumstances in this case corresponded with cases in his practice, and it was undoubtedly one of epileptic vertigo. Epilepsy would tend to shorten life, he thought, but not insanity. Epilepsy was certainly a disease of the brain. There might very probably be an hereditary transmission of epilepsy. Witness saw the prisoner yesterday, but not during the attack. When he saw him the prisoner was totally unconscious. On that occasion he had had a fit of an epileptic character, combined with symptoms which belonged to hysteria.

Mr. Richards, medical superintendent at the Hanwell Lunatic Asylum, gave corroborative evidence from his professional practice. He agreed with the last witness that a person afflicted with epileptic vertigo alternating with epilepsy was unconscious of what he did, and of that the witness gave

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exemplifications from his own experience. He saw the prisoner yesterday when he was unconscious, and from the symptoms he concluded it was an epileptic fit with some modified circumstances. After an attack in such cases memory was a blank. Epileptic vertigo usually alternated with fits.

Mr. John Robinson, an outfitter at Forest-hill, said the prisoner was in his service from September, 1875, until February, and that when spoken to he seemed absent.

Dr. William Smiles, surgeon at the House of Detention, Clerkenwell, said the prisoner was received there on the 18th of December and remained until the 15th of January, when he was removed to Newgate. He was in good health, talked rationally, and witness did not see in him any signs of an epileptic form, nor did he hear of anything of the kind. He saw nothing about him indicating insanity, though there was a good deal of hysteria.

By the Judge.—While he was under witness's observation witness had no suspicion of epilepsy.

Dr. Gibson, prison surgeon at Newgate, said on the 15th of January he received the prisoner into his care. He had continued to see him daily since then. He certainly agreed with the previous witness that the chief symptoms of yesterday's attack were those referring to a hysterical condition, the graver of those symptoms having an epileptic character. In his opinion there might be a distinct convulsive attack in such cases without any premonitory symptoms.

Mr. Justice Lush, in summing up the case to the jury, dwelt on its great importance and its distressing nature, whether they looked at the old man, cut off at a moment's notice in his own house, or as regarded the age and position of the young man at the bar. The law said that every man who took away by an act of felony the life of another, not under provocation, was, *primâ facie*, guilty of murder, and it devolved on a person so charged to show that at the time he committed the act he either did not know what he was doing, or, if he did, that he acted in spite of that knowledge. Every man was presumed to be sane and to possess sufficient reason to distinguish right from wrong. It must be clearly proved that at the time of committing the act the prisoner was not sensible of the quality of the offence with the commission of which he was charged. The test was its being, *primâ facie*, an act of murder, and the question was whether, *at the time it was perpetrated* by the prisoner, he was labouring under such a deficient reason as not to know what he was doing. In other words, did he labour under such an affliction of Providence that he was *for the moment* deprived of consciousness to such an extent that he was a mere automaton *from an attack of epileptic vertigo?* If he did not know what he was doing, the jury ought to acquit him and find him guilty on the ground of insanity. If they were satisfied, in other words, that he was doing an act the nature of which he did not know, they would find him not guilty on the ground of insanity. There was nothing in the case which reduced it to the crime of manslaughter.

The jury retired at 25 minutes to 8 o'clock, and about a quarter of an hour or 20 minutes afterwards returned into Court with a verdict of *guilty* of murder.

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Mr. Justice Lush, assuming the black cap, proceeded to pass sentence. He said, addressing the prisoner, the jury had given the most anxious and careful attention to the evidence, as well that against him as that in his behalf; and they had come to a conclusion in which he (Mr. Justice Lush) entirely concurred. What his motive was in taking away the life of that poor old man was only a matter of conjecture or suspicion. Whether he failed in his endeavours to rob him or intended to ransack the house was a matter of conjecture or suspicion. Whatever the motive was utterly immaterial, it being clear to the jury and to his (Mr. Justice Lush's) mind that the act was a wilful one; and he could now only exhort him to prepare for the fate which awaited him. He would have, in the meantime, the services of a faithful and experienced minister of the Gospel, who, in a loving spirit, would point to sources of consolation in anticipation of the doom that awaited him. He could only pray that the Lord might have mercy on his soul.

The convict, who is a very young man in the prime of life and of prepossessing appearance and manners, was then removed from the bar."

Now, gentlemen, I may, with all befitting seriousness, ask you whether you have ever met with a family history more wofully darkened by the records of transmitted brain disease, than that of Frederick Treadaway? But of how little avail in the defence was its establishment in court! How little, indeed, could it avail with a jury instructed by a judge, who told them that it must be clearly proved to their satisfaction that the prisoner, when he committed the murder was "*for the moment deprived of consciousness to such an extent that he was a mere automaton, from an attack of epileptic vertigo!*"

Which of you, gentlemen, that has ever witnessed the deprivation of consciousness occurring in an epileptic fit, would ever dream of the patient *at that time* committing murder? Is it not deplorable that men sitting in judgment on their diseased fellowmen should be so ignorant of the actual nature of those spinal facts, which they presume to elucidate to men hardly less ignorant than themselves? And yet one can hardly imagine that any of Treadaway's jurors, who had ever witnessed an epiletic seizure, could fail to perceive the absurdity of the judge's instructions. They saw the prisoner under seizure of a fit in the dock, and in consequence of the interruption the trial had to be adjourned till the morrow: did they, or did their venerable instructor believe that at that moment the prisoner was able to commit murder? No physician who has seen epilepsy on a large scale will say that the unfortunate subjects of the malady are most dangerous *in* their fits. It is during the approach, and the

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recession of a fit, that the epileptic is to be feared; *then*, indeed, some are supremely dangerous.

Mr. Justice Lush, as in duty bound, complimented the jury on their polite acquiescence in his own very erudite view of the whole case, including the hypothesis of the prisoner's failure of "endeavour to ransack the house"— a supposition unsupported by any tittle of evidence.

All judges have served a sufficiently long apprenticeship at the bar to render this sort of jury blarneying a chronic infirmity, and we need not wonder, when they become suddenly inspired by the prospect of donning the fatal black cap, that they should court the sympathy of their dozen of scapegoats.

How much might it have mitigated the painfulness of his Lordship's position, had he but known in time, that within the precincts of London one profoundly wise admirer was about to indorse his decision. Who, other than the correspondent of the Toronto *Globe*, should, or could that indorser be?

That no obscurity may rest on this after-piece of the Treadaway drama, I now offer to your admiration the following extract from the *Globe's* "London Correspondent's" letter, which appeared in Toronto on the 20th of March last.

HOMICIDAL MANIA.

The never-ending discussion as to homicidal mania has been revived once more by the unexpected pardon of the so-called Pimlico murderer. A few weeks ago a young man named Treadaway shot a retired tradesman in Pimlico under circumstances of peculiar brutality. Treadaway was engaged to be married to the niece of the man whom he murdered. He made a further attempt to kill the wife of the murdered man, and finally made good his escape with great apparent self-possession and presence of mind. He was captured shortly after, and the evidence against him was so overwhelming that he practically made no endeavour to dispute his guilt. The crime was a singularly brutal and unprovoked one. It was shown by very strong evidence *to have been deliberately planned beforehand*, and the only possible line of defence was that adopted, namely, that the prisoner was not in his right mind when he perpetrated the murder. No doubt the fact of a man's committing a very brutal crime under circumstances almost certain to secure his detection, and without any very apparent adequate motive, is strong *primâ facie* evidence of insanity. Under our system, however, of criminal jurisprudence it is impossible to elicit the whole history of a prisoner's antecedents, unless they can be clearly connected with the offence of which he stands accused. It is, to say the least, possible that if the history of the relations between Treadaway and the family of the girl he was engaged to could have been investigated, some explanation might have been forthcoming as to the *possible motives for the crime*. As it was, the evidence to show that Treadaway was a lunatic *broke down* completely at the trial,

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and he was proved to have been regarded as a sane man by all the persons he had associated with throughout his life, and the *one fact* adduced in his favour was that as a child in arms he had *had an epileptic fit.* In fact, previous to his crime, there was not apparently one tittle of evidence on which his *incarceration as a lunatic* could have been justified, and the question whether the crime was in itself so monstrous as to be proof positive of insanity on the part of the perpetrator was decided in the negative by the jury after a very careful trial, their verdict being distinctly approved by the presiding judge. The execution of the sentence was regarded as a matter of certainty, especially as the crime was not one to elicit any outburst of popular sympathy. But almost at the last hour the Home Secretary had the prisoner examined by two medical men, who reported that in their judgment he was not responsible for his actions, and thereupon the sentence was respited. Mr. Cross is not given to err on the side of leniency, and I believe the truth is that evidence was submitted to him which created *grave cause for doubt as to the man's sanity.* It is clear, however, that this evidence ought to have been submitted in public to a court of law, and not to a secret and irresponsible tribunal. Indeed, the Treadaway case furnishes yet another argument for the necessity of a Court of Criminal Appeal.

This very truthful caterer to the columns of the very truthful *Globe* tells us that the crime "was shown by very strong evidence to have been deliberately planned before hand," and he says that "the one fact adduced in the prisoner's favour was, that as a child in arms, he had had an epileptic fit."

I have read to you, gentlemen, all the evidence bearing upon Treadaway's epilepsy, and the epilepsy and insanity of his blood relations, and I now ask you, whether, supposing the *Globe's* correspondent had heard, or read, that evidence, he is not a jewel of a truth hunter.

"Only as a child in arms he had had an epileptic fit!"

What, then, was that seizure which fell upon the unhappy man in the dock, and forced Mr. Gibson, the prison surgeon, to testify that he "was not in a state to justify the further continuation of the trial that day," and which led Dr. Hughes Bennett, on the next day, to say, that having seen the prisoner after the yesterday attack, he thought it "was of an epileptic character, though somewhat more prolonged than usual." Yet this skilled testimony, corroborated by the subsequent investigation of two eminent alienists, deputed by the Home Secretary to examine the convict, and report on the case, did not screen that Right Honorable adviser of Her Majesty from the censure of the London correspondent of the Toronto thunder-maker! How fortunate for the Imperial Cabinet, that Downing street was so distant from the *Globe* office!

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PLEA OF INSANITY IN COURTS OF LAW.

BY

EDWARD HORNIBROOKE, M.D.,

MITCHELL, ONT.

During the discussion which followed the reading of a paper by Dr. Workman at the last meeting of this Association, I gave notice that at this meeting I would endeavour to obtain an expression of opinion in favour of the principle of placing those charged with crime, and in whose defence the plea of insanity is urged, under the supervision of experts for sufficient time to enable them to determine whether the culprit was insane or not at the time the crime was committed.

The great importance of the subject, the difficulty of deciding in the short time usually allowed for the examination of the accused, the slight opportunities which we have for acquiring experience in this complicated and often obscure disease in ordinary practice, and the unseemly differences in medical opinion which frequently result from the present system, must be my excuses for thus venturing to trespass on your time.

Every registered physician is liable to be called upon, as the law now stands, to say upon oath whether a man is insane or not, and, therefore, whether he should be consigned to the gallows or to the care of an asylum superintendent; and this, perhaps, without having had experience or facilities for studying psychological medicine. The responsibility is great, and the most learned and experienced cannot help feeling, in obscure cases, that he requires time, opportunity, and freedom from the badgering of lawyers, to enable him to determine a question where the issues are as momentous as those between life and death to the accused.

How harassing then must it be to the man on the threshold of his profession, in the presence of his associates, with his reputation, and, perhaps, his whole future prospects at stake, to be called upon to decide, without opportunity for reflection or consultation, a question so difficult as to tax to the utmost the skill and knowledge of the expert who has devoted his whole life to the subject! He is expected to answer categorically the pert queries of a lawyer whose knowledge of insanity has been derived from a few hours'

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study of text books which were written when men held different views of the subject from those which obtain at the present time. The lawyer, the jury, and the majority of the spectators are too apt to think that the man cannot be insane "because he answers questions rationally," and that the doctor who hints that he is not responsible for his actions is a monomaniac, and a fitter subject for the restraints of an asylum than the prisoner at the bar.

If the witness should hint at the difference between "latent" and "developed" insanity, the lawyer is ready to put him to confusion with his legal definitions. With the presumption which arises from ignorance, lawyers and jurymen cannot see that the question is surrounded by difficulties, and they are ready to sneer at the acquirements of the medical witness, who cannot promptly decide a matter which they think so simple. Not so thought Sir William Ellis, who was superintendent to the Hanwell Lunatic Asylum in 1833. He said: "To become acquainted with the "symptoms first indicating insanity not only requires much care "and attention but much experience; for a diseased action of the "brain or some part of the nervous system may be gradually "undermining the health and still scarcely be suspected by "common observers to exist, from the insidious manner in which "it steals upon the constitution at first; it manifests itself by some "trifling aberration of intellect, and that, very generally, on one "point only; such aberration, if unaccompanied by bodily pain, is "not only neglected by the sufferers but disregarded by those "around them ***; and it is only in consequence of the commis-"sion of some *violent outbreak*, that he is at last sent to the asylum."

Now it may be in consequence of this first "*violent outbreak*" that the prisoner is put upon his trial for arson or murder, and we are called upon, without opportunity for "much care and attention," and perhaps without "much experience," to state positively on oath, whether he was insane or not at the time the crime was committed.

As diseases of the heart, liver, or kidneys are diagnosed by disturbances of their special functions, so likewise diseases of the brain can only be diagnosed by disturbance of the functions of that organ. In other diseases we have the aid which the sensations of the patient are capable of affording;—in cases of insanity we have no such assistance, for we cannot be certain that every answer we receive to our questions is not prompted by a desire to deceive; and, therefore, to be

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certain that we are getting a correct history of the premonitory and pathognomonic symptoms of insanity, time, patience, and experience are absolutely necessary. These symptoms are thus summed up by Dr. Forbes Winslow :—"This disorder of the "functions of the brain in the early period of its manifestations "is of so slight and transient a character that it is easily over- "looked by the patient as well as his physician. An apparently "unimportant knitting of the brows, a trifling sensation of numb- "ness in some part of the body, a condition of local or "muscular weakness—a state of *ennui*,—mental peevishness, "irritability, and physical restlessness,—an almost unappreciable "depression or exaltation of the animal spirits,—an impairment "and disorder of the sense of sight,—loss, abberration, or confu- "sion of memory, an inaptitude for mental work,—an inability to "concentrate the attention continuously on any subject, a state of "sleeplessness or condition of lethargy,—a trivial deviation from "the usual mode of talking, such as suddenly pausing in the "midst of conversation, so as to regain a lost train of ideas,—a "slight defect in the articulation, associated with a transposition of "words, and inability to pronounce certain letters, are all charac- "teristic symptoms frequently diagnostic of disease having com- "menced in the brain.

He further says "how often do we discover when the history "of a serious case of brain disease is investigated, that years prior "to its apparent development the patient had exhibited symptoms "of cerebral disorder somewhat similar to those just det iled, "which have entirely escaped observation."

"Slight epileptiform seizures; marked deviations from healthy "thought :—obvious impairment of the intelligence; occasional, "either anæsthesia, or exaltation of sensation in some part "of the body,—trifling loss of motor power, and headache of an "acute type, have existed for some time previously to the supposed "commencement of the disease and yet have entirely escaped "observation, or, if recognized, have been soon forgotten by the "patient and his friends."

These manifold symptoms have to be differentiated from analogous symptoms of disease in other organs, and the slight mental abberrations which have been noticed require to be distinguished from healthy exaggerations, eccentricities, or extravagances, of natural conditions of thought.

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As distressed breathing points to trouble in the lungs, pleura, heart, or pericardium, so, likewise, aberrations of intellect point to disease in the brain ; but diseases of the former organs are accompanied by physical signs which aid the medical man to decide upon the part which is affected, and yet he might find it difficult to explain to an uneducated layman the import of the different signs and symptoms upon which he has based his diagnosis. In incipient insanity the symptoms are obscure, nothing can be learned from physical signs, the patient and his friends are, perhaps, anxious to conceal the true history of the premonitory symptoms, many of which are common to diseases of other organs of the body, and it is only by taking all the symptoms of physical disease, all the observed or authenticated aberrations of intellect, and weighing them carefully in the mind of a man accustomed to such investigations that a correct conclusion can be reached. The medical witness is expected to be able to explain to a jury, which knows nothing of insanity, and cannot understand technical language, the whole process of reasoning upon which he has formed his opinion of the case. His analysis of the case before him may have been as minute and his deductions as logical as those by which the mathematician proves his most difficult proposition. The mathematician would smile if men who never saw Euclid and knew nothing of geometry were appointed to sit in judgment on the correctness of his demonstration ; and yet the law of the land requires that twelve laymen shall try the correctness of the conclusions of the physician who has spent years in the study of psychological medicine. It is about as reasonable as putting a copy of Homer into the hands of one who does not know the Greek Alphabet and asking him to decide whether the scholar translates a difficult passage in the Iliad correctly.

It will be urged that juries directed by such learned judges as those who grace the Bench are quite competent to come to a righteous conclusion in all cases. The learning, integrity, and ability of Canadian judges have won the respect and command the admiration of every citizen. They are too wise, however, to lay claim to universal knowledge, and will, therefore, be ready to admit that their ability to unravel the intricate meshes of diseased thought must be less than that of those who have made the subject the study of their lives. Indeed their want of knowledge of a subject so cognate to their daily pursuits as Medical jurisprudence

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is sometimes glaringly manifested by their utterances on the bench. I heard a learned judge, a few months ago, gravely reprimand a medical man for using the word "abortion" in any other than a criminal sense, and when the witness mildly protested he was told *ex cathedra*, "that was its legal meaning and he would not allow it to be used in any other sense in court." My contention is not, however, that juries are ignorant or that judges are incompetent, but that the symptoms of insanity are often so obscure, and the tricks of the malingerer so multiform and perplexing, that it requires the skill of the trained expert for their discrimination.

The difficulty of deciding when a man is insane was once forcibly illustrated by a case which occurred in my own practice. A well-informed Scotchman was brought to me by his brother, professedly to see if he should be submitted to the restraints of an asylum. His brother was deaf and I could get no history of the symptoms from him. I conversed with the man for hours on a great variety of subjects, and found him a most intelligent and agreeable companion,—well read and perfectly rational in his views on all the ordinary affairs of life. I inquired about every symptom which would indicate brain disease, and got negative answers to my questions. I did not mention the subject of suicide, fearing it might prove suggestive. He appeared to be in perfect mental and physical health, except that, he said, he was troubled at night and could not sleep well, but I could find no evidence of intellectual aberration or moral perversity. I went with him to the late Hon. Dr. Rolph, who spent a long time in conversation with him and failed to detect insanity. We then retired for consultation, and agreed to inquire into his views on the moral aspect of suicide. As soon as the subject was mentioned it was apparent to both of us that we had touched the key for which we had been groping, and that the man was undoubtedly insane. We recommended his brother to have him placed under restraint at once, but that did not seem to meet his views, for the man had property, which he wished to secure for himself to the exclusion of the other relatives. I heard no more of the case for several months, when my insane friend returned and informed me, in the most rational manner, that he had entirely recovered from his "suicidal mania," that he had sold his farm, and wished to obtain my certificate that he was *compos mentis*, for the purchaser had objected to accept

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the title without my certifying that he was of "sound and disposing mind." I gave him his certificate, and a few weeks after he hung himself with a logging chain. He was found dead with his feet touching the ground, so that it must have required all the determination of the confirmed maniac to accomplish his purpose.

Taylor says: "The main character of insanity in a legal view, is said to be the existence of delusion, *i. e.* that a person should believe something to exist which does not exist, and that he should act on this belief." I have a patient under observation at the present time, an active intelligent business man, who labors under delusions as to the chastity of his wife. Although he "believes that to exist which does not exist," he has been able to restrain himself from "acting on that belief;" yet, at one time, he went so far as to purchase a pistol and go to the place of business of the man whom he thought had injured him, for the purpose of shooting him. Should it unfortunately happen that at some future time the controlling power of the will should be less potent, it is impossible to tell who may be the victim, for his insanity is in nothing more apparent than in the character and number of persons whom he suspects. In such an event, the Crown will be able to point to his past history, his business capacity, and his probity, in proof of his sanity. A statement of facts can be laid before medical men, and different opinions, according to the light in which the facts are placed before them, can be obtained from different witnesses. To avoid those differences of opinion, which are the opprobium of the profession, it would seem to be judicious to refuse to offer opinions upon cases which we have not had an opportunity of examining for ourselves. The physician who prescribes for a patient without seeing him renders himself obnoxious to Voltaire's epigram:—his "practice of medicine is the art of introducing drugs of which he knows little into a body of which he knows less;" so likewise the man who ventures an opinion upon a hypothecated case of insanity is likely to bring upon himself the sarcasm of the judge as well as the ridicule of the lawyer. We had lately a very good illustration of this in a court in one of the Western Counties of Ontario. The dispute was about a will where the sanity of the testator was questioned. The lawyers on each side presented their own view of the case before different practitioners, and of course obtained conflicting affidavits. After the witnesses had been cross examined in court before one of the Vice-Chancellors who

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is somewhat noted for his sententiousness, he said, "We will now put aside the medical testimony altogether, and then we shall be the better enabled to return to a common-sense view of the case."

In France when a plea of insanity is advanced the accused is placed for a certain time under skilled observance; but in Canada public indignation was so great that McConnell was sent with all possible speed to the gallows, and the newspapers congratulated the country on the result.

In New York, when the accused pleads insanity as his entire excuse, the court appoints a commission of medical experts to discover whether he was insane or not at the time the deed was committed. This commission, in effect, decides whether he is a fit person to be put upon his trial at all. These commissioners are required to submit a report, not only embodying their opinion but all the evidence taken before them; so that their conclusion can be examined by the court in the light of the evidence; and in no instance yet has the judgment of the commission been overruled by the court. This is, surely, a far better plan than examining medical witnesses before a jury, and "it is said to have done away with the disgrace to the profession, which was so often seen, of the contradictory testimony of experts caused by the same case having been submitted to each of them in entirely different lights."

In the State of Maine, when insanity is pleaded as the only excuse for crime, the culprit is sent to the insane hospital for a time for the purposes of observation.

I do not think the adoption of any or either of these systems would be an incentive to crime, for in the words of Dr. Isaac Ray, "very few of the insane would believe that they are insane, and therefore would not be prompted to crime by the knowledge of the immunity of the insane; nor would they be restrained by the knowledge that the insane were punished, for they believed themselves entirely outside of that class." As we stand now, our local legislatures are powerless, and the rules laid down by our courts are irrelevant, impracticable and inconsistent, and this will remain so until insanity becomes merely a question of fact to be established by medical experts.

This unsatisfactory condition of things might, I think, claim the attention of our legislators, and induce them to change a law which in McConnell's case sent a man too speedily to the gallows, who should have been placed, at least for a time, "under the

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supervision of experts." Had popular clamour, incited by fanatical journalists, biased the minds of ministers of justice, others would have shared the same fate who have since been proved to be insane.

That the responsible advisers of the Crown have generally been guided by the matured opinions of experts, is no reason why the law should remain unchanged. Shakespeare says, "Sailors are but men," and we might add ministers are but men, whose judgment may be influenced by the feelings of horror and indignation aroused by the peculiar atrociousness of murders committed by the insane. It is, I think, generally conceded that some such feeling inflamed the minds of many of the people of Ontario, and likewise determined the action, or rather inaction, of the executive in the case of the man McConnell. And now that public indignation has been appeased by the blood of one victim, we might reasonably, I think, ask Parliament to change a law under which it was possible for us even to suppose that such a foul stain had been placed upon our enlightenment and humanity, and show to the world that, (in the words of England's greatest poet)

> "These violent delights have violent ends,
> And in their triumph die."

NOTE.—Since the meeting of the Association I have been favoured by a friend with a copy of an introductory lecture delivered in connection with the Royal Infirmary School of Medicine by Alexander Robertson, M.D., F.F.P.S.G., physician and medical superintendent Town's Hospital and Asylum, Glasgow, from which I make the following extract:

"Many plans have been submitted with a view to prevent the unseemly collisions of medical evidence in courts of law, but more especially in order properly to obtain the advantage of the light which skilled medical opinion is fitted to throw on cases where the plea of insanity is advanced. These I shall not now stay to discuss, but shall content myself with little more than stating the one which seems to me most likely, if adopted, to yield satisfactory results; it is this: Let the Crown appoint a committee of three medical men skilled in mental disease, in whom they have confidence, and who shall hold their appointment independently of either the prosecution or defence. It shall be the duty of this committee to examine the prisoner as often as may seem necessary, and to report respecting his mental condition, in any case where it is intended to plead insanity in his behalf at the trial. And with a view to the completeness of their report it would be proper to submit to this committee the evidence which they intend to read either in support of the plea or against it. After reading their report in court, the medical men might, if thought desirable, be put into the witness-box, and be questioned respecting it by the opposite counsel. It should not be considered

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competent for either side to bring forward any other skilled witnesses merely to express a professional opinion in the case. The objections to this plan are, first, that it apparently places some restriction on the freedom which the defence at present enjoys in adducing any evidence whatever which may be supposed to favour the accused; second, that the committee holding their appointments from the Crown might be fancied to have a bias, perhaps insensibly, towards supporting the view of the prosecution; third, and mainly, that this committee would, to a large extent, usurp the place of the jury, as the finding in their report would unduly influence the result of the trial. While by no means seeking to estimate lightly these objections, I would simply express my conviction that the advantages of a committee of this kind would distinctly outweigh the disadvantages attending its action."

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TWO CASES OF STENOSIS OF THE TRICUSPID ORIFICE, WITH OBSERVATIONS.

BY R. P. HOWARD, M.D.,

Professor of the Theory and Practice of Medicine, McGill University.

Having two specimens of that comparatively rare form of valvular disease of the heart, Tricuspid Stenosis, in our museum, one of which was obtained from a patient that had been under my observation for fifteen years, I thought it might interest the Association to examine them and hear some remarks upon them.

Let me first give a summary of the clinical features of the case that has been under my own care:

Mrs. ——, æt. 35 years, a beautifully formed and developed woman, the subject of heart disease, had been under my observation for the last fifteen years. Never had suffered from rheumatism, but when eight years old had chorea, induced, it was supposed, by fright. I first examined her heart on 17th May, '62, and made the following note in my day book: "double murmur, mitral systolic and aortic (?) regurgitant, may be mitral obstructive." A month later, after a repetition of the examination, this note was made: "diastolic murmur is loudest at pulmonary cartilage."

In June, '63, she consulted me for dysmenorrhœa and sterility, and an examination discovered anteflexion and a small os, conditions that yielded to appropriate treatment. In March following she had an abortion. On 7th July, '66, she had a threatening of left hemiplegia, with numbness of one side of the tongue. On 3rd August, '66, she gave birth to her first child, at term. She had been for years short-breathed during any exertion, and her lips were always bluish, but during her labour these symptoms were so much increased that she appeared to be in great danger of asphyxia. She suffered so severely also that chloroform was given carefully, but with much relief. Her second and last labour occurred at the 7th month, in October, 1868. It was short and easy.

From that period until January, '74, when she consulted me, suffering from "congestion of the lungs and valvular disease," I saw very little of my patient. She had become pleased with homeopathy. In the following September she felt increasing cardiac uneasiness, but no change was noticed worthy of being

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recorded. She did not seek my advice again till 14th December, '75, which may be called the beginning of her last illness.

She complained chiefly of a sense of fulness and distension in the epigastric zone, of much flatulence, and general nervousness. The cyanosis was much more marked than formerly; œdema of the lower extremities and effusion into the left pleura were also present. Precardial dulness on percussion extended from a little outside the right border of the sternum to at least a finger's breadth outside of left mammillary line. The impulse was irregular in rythm and unequal in force, and the cardiac action tumultuous; visible and tangible pulsation existed over entire precordia. The murmurs so often heard in previous years over her heart were still present, but I regret to say, not suspecting tricuspid stenosis in addition to disease of the aortic and mitral valves, which I had determined years before, *that* close examination and record of the many points of maximum intensity, conveyance and rythm of the murmurs, essential to diagnostic accuracy, was not made, and it cannot be stated *positively* whether a tricuspid murmur existed or not. *Tricuspid regurgitation*, however, was indicated by great fulness and visible pulsation of the jugulars, percussion dulness to right of sternum, commencing general dropsy, and known long-standing disease of the orifices of left heart.

Time will not justify any detailed statement of the progress of the case, suffice it to say that, notwithstanding the employment of digitalis, which at first mitigated the symptoms, of iron, belladonna, diuretics and hydrogogues, the dyspnœa and dropsy increased, hæmoptysis occurred, the urine contained a large amount of albumen, and, after a tedious and painful struggle, her failing heart ceased to beat on the 3rd March, 1876. Acupuncture did not appear to have retarded the issue.

The autopsy disclosed a large heart, with an enormous right auricle, capable of holding a good-sized orange.

The following description of the heart is furnished by Dr. Osler.

Right Auricle.—Internal diameters. From apex of appendix to sinus of coronary vein, $4\frac{3}{4}''$. From fossa ovalis to opposite wall, $3\frac{1}{2}''$. *Capacity*, ʒ iv. ʒ vi. Wall, at base $2\frac{1}{2}'''$; anterior wall, $2'''$. Endocardium thickened, elevated here and there in small patches. Surface mottled, due to fatty areas in the muscles beneath. Musculi pectinati enormously developed over the whole internal surface, with the exception of the portion im-

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mediately surrounding the venous orifices, which was very thin; an exceedingly thick, strong bundle existed in the auricular septum between the opening of the sup v. c. and the fossa ovalis. At this place the septum was 4‴ in thickness. The musculi pectinati were especially developed over the upper and anterior regions of the auricle, extending also low down towards the tricuspid orifice. Their surfaces in many places showed firm elevated lines of fibrous degeneration. Muscular fibres very fatty. Sinus of the coronary vein admits the top of the thumb, and the little finger can be passed into it to the depth of an inch and a half. Four or five bands of fibrous tissue stretched across the orifice. A well marked eustachian valve was present.

Firm ante-mortem clots occupied the appendix, interlaced with and attached to the musculi pectinati. So intimately united were many of these to the endocardium that the latter was torn away on removing them. The central part of the largest of these clots had softened, and contained a small amount of reddish fluid, in which, among much debris and fatty matter, were numerous corpuscles of Gluge.

Left Auricle.—Appendix small. No musculi pectinati in the sinus itself. Thickness of wall at thickest part a little over one line. Capacity ʒ i. ʒ v.

Right Ventricle.—Thickness of wall, anterior surface, 2‴. Thickness of ventricular septum midway between apex and mitral orifice, 6½‴. Distance from pulmonary ring to apex 3½″.

Tricuspid Orifice.—Diameter only 7½‴; width at widest part 4½‴; admits little finger to the first joint. The cusps of the valve have united and formed a dense white fibrous septum between the auricle and ventricle, leaving an oval orifice of the dimensions given.

Pulmonary Orifice.—Circumference 3″; valves normal.

Mitral Orifice, constricted; admits *index finger half way to first joint*, equal 2 inches. Its valves united so as to form a funnel, with its apex in the left ventricle; they are shrivelled and as thick as buckskin. The chordæ tendineæ also much thickened and shortened so that they retain the valve in the ventricle, and must have prevented its elevation by the blood and its closure during systole. At attachment of the tendons of the larger segment to its papillary column a mass of ossification exists. The tendons generally are as thick as an ordinary silver probe.

Aortic Orifice also stenosed; its three segments are united at

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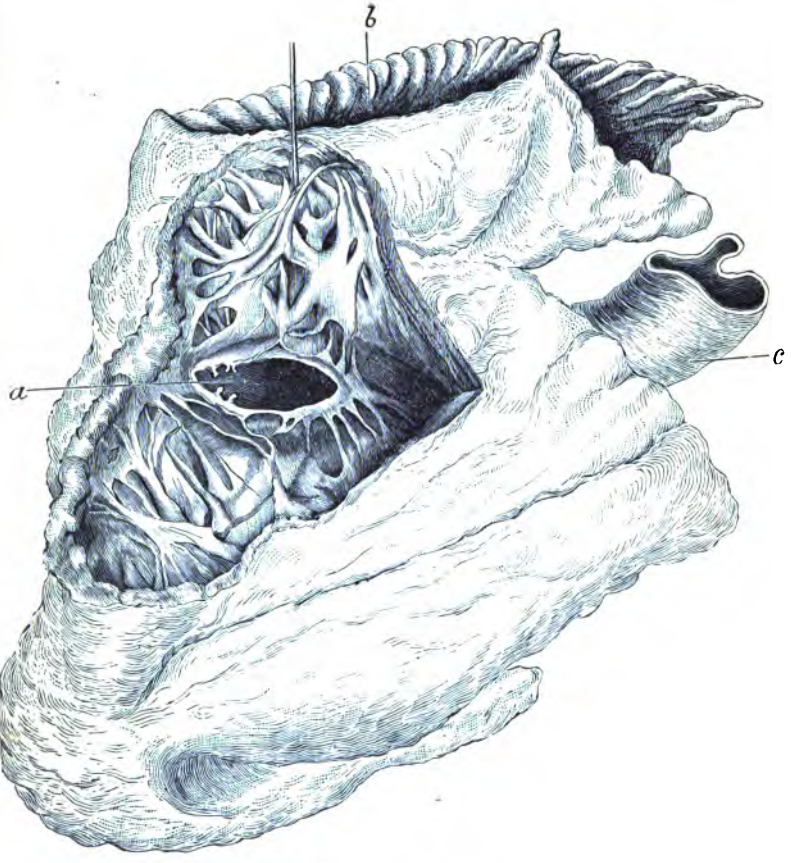

EXPLANATION OF FIGURE.

(*a*)—*Tricuspid Orifice.*
(*b*)—*Right Auricle.*
(*c*)—*Pulmonary Artery.*

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their angles and edges so as to form a funnel-like projection up the vessel, at least three-fourths of an inch in longitudinal diameter. The orifice admits *point* of *index finger*, equal 1⅞″ in circumference. The segments are thick, opaque, and fibroid; their edges rounded, and as thick as buckskin.

The sinuses of Valsalva form deep pouches which receive point of index finger for two-thirds of an inch. Patch of atheroma in aortic arch. Rest of aorta not examined.

Liver reduced in volume in all diameters, its edges absorbed, pale grey colour, hob-nailed, tough, almost crunches under knife; and substance not congested, as it must have been under the circumstances had it not undergone *cirrhotic* changes.

Spleen shrivelled about 2 oz. in weight; firm, cutting like liver, and resembling it on section; not containing any excess of blood. A second spleen, size of a small cherry, with a large vein in connection with it, is present.

Both *Kidneys* thick, of full average size and *very firm;* capsules of both opaque, thickened, and adherent; a cicatrix-like depression upon surface of one; structure on section coarse-looking, not mottled, proportion of cortex to pyramids about normal; substance resists knife and tears with difficulty; is of dull red colour uniformly, contains no excess of blood. Kidneys weigh about an ounce over average. In one a hæmorrhagic infarct, size of a pigeon shot, and near it a cubical wedge of cortical substance quite anæmic as if from embolism.

This second heart from our Museum resembles very closely that just described, but there is no record of the patient from whom it was obtained. Dr. Osler has kindly given me the following description of it:

Whole organ much smaller than the preceding specimen.

Right Auricle much dilated, would hold a good-sized orange. Musculi pectinati strongly developed in both sinus and appendix. Orifice of coronary vein large, admitting the tip of little finger.

Tricuspid Orifice of *oval* form, the segments of the valves having united to form a curtain. (See figure, a). The margins are a little thickened, and on the auricular side are a few vegetations. Circumfeernce of orifice, 1⅞″. The chordæ tendineæ passing to the septum are very small, as are also the musculi papillares in this situation.

Right Ventricle.—Length from tricuspid orifice to apex 2⅛″ from pulmonary ring to apex 3⅛″. Wall hardly one eighth of an inch in thickness. Capacity small compared with that of right auricle.

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Pulmonary Orifice, $2\frac{3}{8}''$ in circumference. Valves healthy, one segment fenestrated.

Left Auricle much dilated, even larger than the right, endocardium opaque and thickened.

Mitral Orifice is represented by a narrow chink, having from the auricle a somewhat semicircular outline. Length about $\frac{1}{2}''$, breadth, $2'''$.—The portion corresponding to the aortic segment of the mitral is very firm, quite calcareous, and from the auricle presents a thick dense border. The chordæ tendineæ which pass from the anterior papillary muscle have united into a dense, fibrous, and partly calcareous, cord. The posterior segment is very rough on its auricular surface. The chordæ from posterior papillary muscle, and those passing to the posterior segment from anterior papillary muscle, are thick and short, but still separate. The apices of these muscles are quite fibroid.

Left Ventricle.—Length from aortic ring to apex $3''$.

Wall (Anterior,)—$\frac{3}{8}''$ in thickness.

Aortic ring, $2\frac{1}{8}''$ in circumference. Segments of valves thickened and contracted, especially the left.

The aorta does not appear atheromatous. Circumference half an inch above segments, $2\frac{3}{8}''$.

The musclar substance of the heart is of a pale yellow colour, and is fatty.

In both these examples the deformity of the tricuspid valve is alike. The cusps by their union have formed a circular diaphragm at the tricuspid orifice with an elliptical opening in it, while in Peacock's cases [1] it appears to have been triangular in shape. In both, the mitral orifice is also narrowed, and the mitral valves seriously deformed. In the first, there is, in addition, marked stenosis of the aortic orifice from union and fusion of the aortic segments, and the resulting lesion closely resembles that delineated in Cardwell's and in Lebert's plates. It must have produced obstruction of and regurgitation through that orifice.

In the second, the aortic valves are also thickened and contracted, and must have interfered more or less with the normal circulation. In this respect these cases are not singular.

Indeed, so rarely does stenosis of the tricuspid orifice occur *per se*—that is, unaccompanied by disease of the other orifices, and especially of the left heart—that Rosenstein says such a case "is not recorded."

(1) Valvular Dis. Heart, p. 24.

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In Dr. Foster's remarkable case, all the valves save the tricuspid were healthy, but the aortic and mitral *orifices* were narrowed.[1]

It is this almost invariable co-existence of tricuspid stenosis with lesions of the other orifices of the heart that has led to the overlooking, or even obscuration, of the former disease. The pre-systolic murmur of mitral constriction may mask, or be confounded with, the pre-systolic murmur of tricuspid obstruction; and this is all the more probable because, first, while the mitral murmur is of frequent occurrence, the tricuspid obstruction is so rare that few authorities claim to have heard it. And secondly, because experts are not agreed as to the site of maximum loudness of an obstructive tricuspid murmur. Walsh places it at the ensiform cartilage; Hayden localizes it on the *left* of the sternum at the level of the ensiform cartilage; Rosenstein[2] refers it to "the right border of the sternum about the 4th rib"; while in Foster's case,[3] in Smith's case, quoted by Flint,[4] and in Cryon's, cited by Hayden,[5] it was loudest at the ensiform cartilage and to the *right* of that point.

As to the period of life at which obstructive disease of the tricuspid orifice originates, it is the opinion of Peacock and other authorities, that the lesion is set up in fœtal life; but although such is the general opinion, I submit the following arguments to prove that these cases of tricuspid stenosis, associated with disease of the valves of the left heart, are not congenital.

1st. Bearing in mind the frequency with which post-congenital endocarditis involves at the same time both the mitral and the aortic orifices, it might be expected that, when in the fœtus inflammation affects the tricuspid valve, it will likewise, more or less frequently, engage the pulmonary—more especially, as it is admitted by most pathologists, that congenital disease of the pulmonary orifice is much more frequent than of the tricuspid, and is probably due to endocarditis,[6] which is equivalent to saying that in the fœtus the pulmonary orifice is especially obnoxious to inflammation. Yet what is the fact? So rare is the combination of constrictive disease of the tricuspid orifice with stenosis of the pulmonary artery and insufficiency of its valves, that Rosenstein[7] says there is "only one case on record."

(1) Clinical Medicine, p. 328. (2) Ziemssen Cyclopedia, p. 150. (3) Lot. Cit., p. 324. (4) Pract. Treatise Dis. Heart, 2nd ed., p. 243. (5) Dis. Heart and Aorta, p. 1013. (6) Vide Rindfleisch Path. Histology, 1, p. 298. Lebert in Ziemssen's Cyclopedia 6, p. 314. (7) Ziemssen, vol. 6, p. 163.

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2nd. The perfect closure of the foramen ovale present in these cases of tricuspid stenosis is opposed to ante-congenital origin of the stenosis. That opening does not usually close till a few days after birth; and is it not highly probable that constriction of the tricuspid orifice in fœtal life, by opposing the current of blood from the right auricle into the right ventricle, would tend to keep the foramen ovale from closing? Yet, in no instance of tricuspid stenosis that I have read is it stated that the foramen ovale was found open.

3rd. The perfect fusion of the segments of the several affected valves so as to form membranous diaphragms may as well be a consequence of inflammation in childhood as during fœtal existence; and as an actual fact, several of the cases appear to have originated in an attack of acute rheumatism, or, as in my case, of chorea in childhood.

4th. The view just expressed is more in accordance with pathological knowledge than is the theory of intra-uterine origin. Two of the most fruitful causes, or at least accompanying conditions, of valvular disease in childhood, are rheumatism and chorea. Now, when the fact is borne in mind that the former disease in children very frequently escapes the attention of parents and even of the attending physician, it is not surprising that enquiry made years after into the history of these cases should fail to trace rheumatism as a cause.

Whatever the relationship between chorea and rheumatism may be, when the records of a case of valvular disease mention a former attack of chorea, as obtained in one of these cases, we may fairly, in the absence of a known attack of rheumatism, connect the valvular affection with the chorea, rather than assume the occurrence of an endocarditis in utero.

Finally, on this point, it may be a mere coincidence, but it is at least worth mentioning, that after looking over twenty-two reported cases of tricuspid stenosis collected from several sources, it appears that a large majority of these sufferers were females—seventeen out of twenty-two.[1] And Tuckwell has shown that in children acute rheumatism and likewise chorea predominate in the female sex. However, it is but truthful to add that Rosenstein's

(1) I have not included two of Hayden's cases and one of Balfour's, as the diagnosis had not been confirmed by a post-mortem examination. Dr. Gairdner's case was one of Tumour, which closed the tricuspid valve when it slipped into it, and was also excluded.

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experience has led him to believe "that women, especially in their early years, suffer more frequently than men from valvular disease." [1]

The exanthemata are not infrequently causes of endocarditis in children, and doubtless may often account for chronic valvular disease, the origin of which cannot be referred to a previous attack of rheumatism or chorea. For these reasons I incline to refer these rare cases of stenosis of the tricuspid and mitral orifices not to inflammation set up during intra-uterine life, but during childhood, and, perhaps, in some exceptional cases, during later life.

Since writing the above, the 4th volume of Reynolds' System of Medicine, containing Hilton Fagge's article on "Diseases of the Valves," has come to hand, after a long delay, and I am pleased to find that he, like myself, objects to the generally-received opinion. He does not enter at any length into the subject, but, while discussing the etiology of disease of the mitral valve, incidentally makes the observation that "as a matter of fact, there is no proof that disease of the tricuspid valve before birth is otherwise than an exceptional occurrence." [2]

A circumstance of much interest in many of these cases, and notably in my own, is the great length of time that severe obstructive and regurgitant disease of the tricuspid orifice may exist without inducing dropsy or other grave consequences, and this notwithstanding the co-existence of serious obstruction, or both obstruction and regurgitation at the mitral opening, and even at the aortic also. The explanation of this protracted course appears to me to involve two or three important factors:

First. As the lesion generally originates in early life when the reparative and adaptive powers are unimpared, a compensating hypertrophy of the walls of the heart is established which proves equal to the obstruction of the circulation caused by the diseased valves and orifice, and the normal equilibrium, so to speak, is restored. Those important complications, so frequently present in the valvular affections of elderly persons, dilatation, fatty degeneration and spanæmia, are not so prone to supervene in children and young persons, and, so long as they do not, the compensating hypertrophy proves equal to the maintenance of the circulation.

[1] Loc. Cit., p. 100.
[2] Vol. 4, p. 613.

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But, secondly, in these cases of tricuspid stenosis a similar condition of the mitral orifice almost invaribly co-exists, and, not infrequently, as in the first of the specimens, of the aortic orifice as well, so that a sort of *corresponding* degree of narrowing affects the *orifices* of the *right* and of the *left* heart—whereby their relative sizes are more or less nearly preserved. Thus, in case No. 1, the circumference of the tricuspid aperture being $1\frac{7}{8}''$, that of the mitral was exactly $2''$ and of the aortic $1\frac{7}{8}''$ and of the pulmonary $3''$.

In case 2 the circumference of tricuspid was $1\frac{7}{8}''$; of mitral $\frac{1}{2}''$ in length by $2'''$ in breadth, of aortic $2\frac{1}{8}''$, of pulmonary $2\frac{3}{4}''$.

Sizes { No. 1. Tricuspid $1\frac{7}{8}''$. Mitral $2''$. Aortic $1\frac{7}{8}''$. Pulmonary $3''$.
No. 2. do $1\frac{7}{8}''$. do do $2\frac{1}{8}$. do $2\frac{3}{4}''$.

The relatively good size of the pulmonary orifice in both cases is probably owing to its immunity from inflammatory changes, and to a certain degree of obstruction to the pulmonic circulation, caused by the narrowing of the mitral orifice.

The only other pathological fact of interest that time will permit to be mentioned is the condition of *fibroid* degeneration (or cirrhosis) in which the liver, spleen and kidneys were found in the first case. As the patient was of the most temperate habits, the fibroid degeneration may, perhaps, after Sir Wm. Jenner, be referred to the existence for many years of a remora in the venous circulation. The condition of the viscera in the second case, as well as its clinical history, is unknown.

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TYPICAL CASE OF ADDISON'S DISEASE.

WITH REMARKS.

BY GEORGE ROSS, A.M., M.D.

Professor of Clinical Medicine, McGill University, Attending Physician Montreal General Hospital. Reported by Mr. H. N. Vineberg, Clinical Clerk.

J. F., æt. 23, coal carter, was admitted into the Montreal General Hospital, on the 9th June, 1877, under the care of Dr. Ross, suffering from discolouration of the skin, pain in the stomach, vomiting and weakness.

Nothing can be learned concerning his previous family history except that his father and mother are both living, and no account of tuberculous disorders can be heard of amongst any other members of the family.

He himself it seems took very early to drinking habitually, getting very drunk quite frequently. He was, in consequence, necessarily exposed to much hardship, sometimes even lying out in the cold and rain. He continued thus intemperate until about two years ago, when his present ill-health began. Up to this time he says he never knew what it was to be sick. He then began to complain of being weak, and suffered from giddiness a good deal, and sometimes from pain in the front part of the head. He continued, however, to work until last fall, but often feeling that he was not strong enough for it. The giddiness also kept increasing, so much so that he many times when stooping down, rolled over quite helpless, and he was often suspected of being drunk. Is not aware of having ever strained himself, but, of course, did very labourious work. His appetite had been failing and he was becoming very singular in his selection of food. For instance, he could not eat butter, but insisted upon having *lard*, and he had a strong craving for *acids*, especially pickles and vinegar, which latter (if his father can be believed) he would drink pure by the pint at a time. He also had attacks of *vomiting* not unfrequently, even whilst at work, and often suffered from pains in various parts of the body—" all over him " as he says. Besides these, the following symptoms have also been observed, and have been growing steadily more marked since last winter. *Breathlessness* upon the least exertion. *Drowsiness*, tending at once to fall asleep if left to himself, and such intense *feebleness* that he could not possibly

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walk straight. The latter being most marked immediately after getting up in the morning, when he reels and staggers about like a drunken man. Cold *extremities*, especially his hands: his father remarked him wearing mits in warm weather, and often going to the stove to warm his feet. It is somewhat more than a year since the *discolouration* of the skin was first noticed by his friends, but it certainly existed much longer, because it was learnt that last summer his father, on coming home after an absence of just a year, hardly recognized his own son, owing to the great change which had meantime occurred in the colour of his skin. He has never fainted, and is not aware of having had attacks of palpitation of the heart.

Present Condition. Patient is a man rather above the ordinary size, well-built and well-nourished. He has brown hair and brown eyes. He lies in bed with a dull, heavy and stupid expression, and when left alone is continually sleeping; in fact, it is difficult to keep him awake long enough to get from him answers to a question or two, and even then means have to be taken to keep up his attention or he would immediately relapse into the same lethargic slumber. When first roused up he whines and laments like a child, making piteous kind of grimaces, the forehead contracted and the angles of the mouth drawn up. Having gone through this performance, it is generally necessary to repeat a question two or three times before any intelligible answer can be procured. The entire skin of his body is of a dark brown colour, resembling in appearance that of a Malay or a white man who had been deeply stained with walnut juice. It in all respects agrees perfectly with the descriptions given of the most typical cases of *Morbus Addisonii*—The discolouration is most deep upon the face, neck, nipples, lower part of the abdomen, penis and scrotum, and the backs of the hands. It is least marked over the lower extremities. The pigment is particularly intense on the genital organs, which indeed are nearly as dark as in a veritable negro. The backs of the hands are of an extremely dark mahogany brown, the colour terminating by an abrupt margin on the lateral aspects and contrasting strongly with the corresponding palms which are comparatively quite pale. The line of boundary of the pale portion in the palm is also well seen on the anterior aspects of the wrists at which part the deep colour of the forearm suddenly ends by an abrupt straight margin. There are several very dark brown (almost black) circular spots or moles upon both cheeks,

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and a few also upon the front of the abdomen and upon the back. The *mucous membrane* of the lips, cheeks and tongue, all show marked black pigmentary mottlings and patches. The inside of the lower lip presents about its middle a beautiful generally distributed marbled appearance. At the inner margin of the red exposed portion of the lower lip is to be seen an irregularly scalloped dark line, about one line in width and running the whole length of the lip. There is also a black patch on the gum of the lower jaw at a spot corresponding with the two left incisor teeth. On the left side of the tongue are two similar dark blotches, one near the tip and the other a little further back, these look just as though the back of a pen had been rubbed over them.

All the mucous membranes visible are of a healthy red colour, the nails of the fingers and toes are also of the ordinary pink colour of health. The eyes are somewhat bloodshot, pupils moderately contracted and respond freely to light, Temperature. 100·2° F. Tongue rather coated with a light brownish fur. Appetite bad. Bowels rather loose. Pulse, 80, small, weak and very easily compressed. Heart sounds distinct but markedly feeble; not accompanied by any murmurs. Apex beat in normal situation. Lungs healthy. Liver and spleen occupying their proper areas. No abdominal pulsation detected. Has passed no urine since admission yesterday: withdrew 6 oz. with catheter. It is high coloured, sp. gr. 1008, no albumen, no sugar, becomes very dark when boiled with nitric acid.

There seems to be some general hyperæsthesia, as a moderate squeeze anywhere will cause him at once to whine and cry out. Complains much of pains everywhere, and especially headache. He was got out of bed and ordered to walk across the ward, when he plunged and staggered along in the most headlong way and would have fallen at once if not supported. He begged to be allowed back to bed, and threw himself down utterly exhausted and his heart beating very rapidly.

Blood from the finger was examined; no increase in the number of the white blood corpuscles. The fibrine fibrils were unusually distinct, otherwise it was quite natural. Schultze's "granular masses," so common in cachectic states, were not observed.

Ordered. Milk diet with beef tea and ℞. Morph. sulphat gr. $\frac{1}{16}$ Bism. nitrat. gr. x. every six hours.

11*th June.* Passed a very restless night, whines and cries to-

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day even more than yesterday. Vomited several times during the night and morning. Takes no food, but craves water continually, but when given to him often does not drink any. Severe headache, very weak and staggering when trying to stand. Passed a considerable amount of urine, sp. gr. 1010. No albumen. Temperature, 98·4° F.

12*th June.* Somewhat quieter and more rational to-day; takes more nourishment, but vomited two or three times through the night, and now sitting up at once brings on an inclination to vomit. His eyes were examined to-day by Dr. Buller; no abnormal appearances were noticed. The pigment in the fundus was abundant, but not unusually so for a dark-haired person.

13*th June.* Had a bad night and seems worse to-day, very weak and complains much. Is somewhat deaf. No vomiting since yesterday. Passed a very copious stool yesterday of a singular grey colour. Pulse remains small, weak and compressible, 80 per minute. Temp. 96· 4° F. Other symptoms unaltered.

Ordered 3 oz. wine daily.

14*th June.* A much better night. Seems singularly improved to-day; makes no complaint of pain of his own accord, but when asked says he has pain in his back and down his legs. Had three motions similar to that described. No vomiting. Tongue moist, and only very slightly coated. Pulse rather better, not so shabby as during last three days. Temperature, 95·4° F. and 97·8° F. Blood again examined, same result, exactly, as before.

15*th June.* Slept well last night; seems better than any day yet; does not whine and complain at all; is much more intelligent, and answers questions quite readily; not nearly so drowsy as he has been; is taking food well; cannot stand upright without being supported. Urine as before. Temperature, 95. 4° F. and 97 . 8° F.

16*th June.* About as yesterday, still pains in back and down the legs. Temperature, 95·4° F. and 96·4° F.

17*th June.* Not so well to-day; pains all over; sleeps nearly all the time. Pulse about 90, but very difficult to count, it is so extremely small and shabby. The foregoing note was made at 11 a.m., and he continued about the same way until 7 p.m., when he became very restless, crying out to send for his father. He was now seen by one of the resident physicians, who found him rolling about in bed, covered with a cold clammy sweat. Pulse very small and irregular, and complaining of general pains and especially cramps in the left leg. Frictions and warmth, together with

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stimulants, internal and external, were freely used, but with only temporary rallying effect, for within three-quarters of an hour he was evidently moribund, and died at 8.15 p.m.

AUTOPSY, BY DR. OSLER, 16 HOURS P. M.

Body that of a tall, well-formed young man. Muscles of average development, and in good condition. Panniculus adiposus scanty. Skin presents the appearance described in the clinical report. Rigor mortis present.

Thorax.—Muscles of a healthy red colour. *Thymus gland* appears enlarged, weighs ʒ vi. On examination only the normal elements are found.

Heart, 240 grms. Right auricle distended with blood, and on opening it 3 to 4 ounces of dark semi-coagulated blood escaped. Right ventricle also full of grumous clots. Left auricle contains blood; Left ventricle contracted and empty. On removal of the organ fully 14 oz. of blood escaped. Valves and orifices healthy. Muscular substance of good colour; the fibres are slightly granular, but the striæ are not obscured, and there are no definite oil droplets to be seen. *Aorta*, healthy.

Lungs, crepitant throughout; no adhesions; no nodules, tubercles, or caseous masses.

Abdomen. Viscera look natural.

Spleen not enlarged, slightly adherent to the diaphragm. Consistence good. Malpighian corpuscles distinct. Structure normal.

Kidneys.—Capsules detach easily; surfaces smooth; one or two small cysts noticed. On section Malpighian corpuscles prominent, cortices and medullæ, with the exception of the mammillæ, of a dark brownish-red colour. Nothing abnormal found on microscopical examination.

Supra-renal Capsules.—Left feels firm, and is bound to the neighbouring parts by fibrous adhesions which were with difficulty torn through. On removal it weighs ʒ vss., and has lost its cocked hat shape, being somewhat oval, and about the size of a large testicle. The surface is irregular, puckered, and here and there round nodules softer than the rest project. Two thin remnants of the gland are attached to the central mass. One, an inch in length, passed downwards from the posterior part, and in it are several small caseous nodules; the other, springing from the anterior part, is not so marked, and contains no nodules. One good-sized artery and two small ones enter the gland at the lower border. A few nerves of ordinary appearance are seen going to it

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On section with a sharp knife, it cuts with considerable resistance, and is seen to be made up of central caseous masses, surrounded by dense semi-translucent fibrous tissue, 3‴ to 4‴ in thickness, and in places very firm and hard. The caseous masses are separated indistinctly into two portions by a strand of gelatinous looking tissue, and are firm, greyish-yellow or cream coloured, soft at the periphery so that they can readily be pealed out of the fibrous investments. In one central spot the caseous matter is becoming very dry and cretaceous. *The right capsule* is larger than the left, and lies in its normal position on top of the kidney and in contact with the liver, to which it is united by fibrous bands. The investing fat is in small amount, but very fibrous. The organ has completely lost its flattened shape, and appears made up of two irregular nodules, the upper of which projects towards the liver, the lower, somewhat triangular in shape, passing down towards the hilum of the kidney, and to its under surface the renal vein is attached. To the touch they are firm and elastic. Two medium-sized arteries, one a branch of the renal, enter at the lower border. A few nervous cords are seen entering the gland, but they are neither numerous nor large. On section essentially the same condition is found as in the other organ; the upper mass has a firm caseous centre, of a uniform greyish-yellow colour, moist, not friable, and softening only at the margins where it is in contact with the fibrous capsules. In the other portion the caseous matter is softer, here and there cretaceous, and interspersed with gelatinous looking fibrous tissue.

On examination the central caseous masses present nothing of interest, being composed of a finely granular debris in which the remains of degenerated cells and fibres may be seen.

Scrapings from the inner surface of the fibrous capsules show a large number of small lymphoid corpuscles, finely granular, and not very distinctly nucleated. A few are large and more granular. With these are numerous spindle-shaped fibre cells, which are the chief elements in the investing capsules, the lymphoid corpuscles occurring in groups or scattered irregularly among them. In the soft gelatinous-looking tissue immediately surrounding the caseous masses and often penetrating them, in addition to the above elements, which also occur in variable numbers, there are found:—

(1). Cells two or three times the size of white blood corpuscles, with one or two nuclei. Many are in a condition of fatty degenera-

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tion, others have been converted into the compound granule corpuscles.

(2) Numerous corpuscles resembling the nerve cells described as occurring in the adrenals. They are chiefly unipolar, with coarsely granular protoplasm and single nuclei, and with a long process passing off from the body of the cells, rendering them club-shaped; corpuscles with two or three processes are also common. Many of these look very like ganglion cells, in others the processes are more irregular and the resemblance is less striking.

(3) Giant cells, of which a number of well marked specimens were found.

Bladder contains about ℥ x of clear normal urine. Walls healthy.

Stomach. Large veins full, small vessels of mucous membrane at the fundus also injected; rest of the membrane pale. Scattered throughout the whole mucosa, but chiefly about the cardiac and pyloric extremities, are numerous small, round, white bodies, looking like little lenticular glands. Some of them present small orifices in communication with the surface, as if they had ruptured or ulcerated at these points. On examination they are found to be localized lymphoid infiltrations of the mucosa.

Duodenum is blood-stained, and the small vessels are full of blood.

Jejunum, and *Ileum* contain a small amount of dark tarry fæces, closely adherent to the mucous membrane. The large veins are injected. The solitary glands and patches of Peyer are slightly enlarged. Here and there on the mucous membrane of the jejunum are small dark spots which cannot be washed off and appear to be pigmentary depositions. About six or eight feet from the ileo-cæcal valve a portion of the intestine 8″ in length is curiously thickened, being at least five times as thick as the adjacent parts, and of a somewhat brownish-yellow color. Several thick, partially developed, valvulæ conniventes are seen on the mucous surface. On section the surface is uniform, presenting no separation of mucous and mucular coats.

Large intestine presents nothing abnormal. The solitary glands are very distinct in the cæcum. There are several masses of dark fæces in the descending colon.

Liver. Weight, grms. 900. Capsule slightly thickened, especially over the gall bladder. On section, organ looks healthy, surface is uniformly reddened, acini not very distinct. The veins contain

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a good deal of blood. In certain regions the substance beneath the capsule is stained of a dark colour; on examination this is found to be due to an accumulation of dark pigment grains in the liver cells, which were, as a rule, slightly granular, and here and there contained oil drops.

The *lymphatic glands* of the abdomen, including those of the mesentery, were a little enlarged; one or two were removed with the supra-renal capsules.

The cæliac axis with *semilunar ganglion* and attached nerves were carefully removed. Nothing unusual was observed about them, the sheaths of the nerves were not thickened, and the cells presented a natural appearance. Long splanchnic nerves and dorsal and lumbar ganglia of the sympathetic also examined. All these parts were compared with those of a woman, aged 40, dead of heart disease, on whom an autopsy was made on the same day, and no appreciable differences found.[1]

Marrow of ribs of a light red colour, abundant, and evidently fatty. On examination, red blood corpuscles exceed all other elements. Marrow cells of usual appearance. The small lymphoid corpuscles, so often met with in marrow, were not noticed. Fat globules more numerous than usual in the ribs. No nucleated red corpuscles, myeloplaques, or corpuscles containing red blood cells noticed.

Remarks. I believe this to be the first genuine case of uncomplicated Addison's Disease which has been publicly communicated or published in Canada. The only other report of which I am aware is one by Prof. MacCallum of Montreal, published in the *Medical Chronicle* for the year 1857. This case, however, must, I am inclined to think, be looked upon as somewhat doubtful. The patient was the subject of ordinary pulmonary phthisis, and when first seen was in an advanced condition of emaciation, with, at the same time, all the ordinary symptoms and physical signs of this disease. He was distinctly bronzed on the face, back

1 It is only just to state, with reference to the condition of the nerves going to the capsules, that no dissection of them was made *in situ* for the following reason: On the evening of the patient's death the father positively refused, in spite of all arguments, to allow of an autopsy, and, as he was going to remove the body in the morning, the supra-renal capsules, with the kidneys and portions of the liver and spleen, were taken out that night *per vias unnaturales*, viz., through the rectum. It was done without any tearing of the capsules, and the right one was removed attached to the kidney. On the following day the father was in a better state of mind, and consented to an examination, when, as above mentioned, the cæliac axis, with the semi-lunar ganglion and attached nerves were removed.

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and hands and in the axillæ. On the chest he had a patchy discolouration which was probably chloasma. Affection of the supra-renal capsules was suspected by Dr. MacCallum during life and after death one of these was found much enlarged, tough and almost cartilaginous; the other was soft, easily broken down and showed no sign of disease. Thus here the only relation with Addison's Disease was the discolouration (which is well known to be *alone* entirely fallacious as a sign) and pathologically there was found none of the true caseous disease in any of its forms, which alone constitutes the invariable morbid lesion of this disease, according to Wilks, Greenhow and other recent observers.

The case just read may be looked upon as a typical and uncomplicated case of Addison's Disease. As far as the clinical features of this affection are concerned, they have now been studied by a great many observers, and the essentials may be considered as pretty clearly settled. It is interesting to observe how little in this way has been done to add to the original delineation of the complaint given by Addison himself. But a great deal has undoubtedly been done to elucidate its pathology and to establish the certainty of the morbid lesion—which had long been doubtful, and even yet is not universally admitted. The names of Drs. Greenhow, Wilks, and Habershon are those which are most prominent in this connection. I would like to make a few remarks upon certain of the prominent symptoms which have been above detailed, and on the bearing of some of the facts upon certain doctrines newly broached concerning the alliance between this disease and some forms of anæmia, especially progressive pernicious anæmia.

The Asthenia. To show to what a remarkable degree this profound debility was present, I need only recall some of the symptoms to which it naturally gave rise, the inability to stand, the great languor and indisposition for the least exertion, the incapability to grasp with any degree of power, and all this without any apparent diminution in the bulk of the muscles, or any sufficient degree of emaciation. In many descriptions of this disease *anæmia* is placed along with *asthenia* and often made to some extent to account for the latter; but I think it may very well be doubted if anæmia be really an *essential* part of the affection. Certainly this case tends rather to support the idea that the most profound degrees of asthenia and prostration may be induced by supra-renal disease, without being accompanied by any

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of those changes in the blood going under the common term anæmia. It will be observed that the report states that there were none of the ordinary rational signs of anæmia present; the mucous membranes, where visible, were as red as in health, the nails were quite pink, not white, there was no cardiac bruit, the blood, when drawn, was not at all watery-looking, and microscopical examination of the same proved that its cellular elements appeared just as in health. At the autopsy the muscles were found containing abundance of blood, of good consistence, and of the usual full bright red colour of perfect health. It is plain that it needs but one such case properly substantiated to show that the fully developed affection may exist and may prove fatal without there having, at any time, been the least appreciable anæmia. This is an interesting point to settle. Dr. Addison, in his original description, placed anæmia *first* amongst the prominent symptoms present; and quite lately Prof. Pepper, of Philadelphia, has, in an able paper, tried to substantiate an alliance between Addison's Disease and some forms of chronic wasting disease, all accompanied by profound anæmia and which he proposes to call *Anæmatosis*. There is no denying the fact that it is quite common to find patients with this disease decidedly anæmic, but that might naturally be expected as a secondary result, from impaired digestion and nutrition. It would be impossible within the limits of these remarks to endeavour to contravert the views of Prof. Pepper, but I must content myself with drawing attention to the entirely negative results of this typical case, as wholly opposed to his theory. This is simply in accordance with the experience of Dr. Greenhow, for he says "so far as I have been able to ascertain, the composition of the blood does not undergo any important alteration in uncomplicated cases of Addison's Disease." I have also under observation at the present time (singularly enough, considering the rarity of the complaint) a second patient, a female, with intense bronze skin, and who, I am convinced, is the subject of supra-renal disease. Her symptoms are, though not so intense, yet just as characteristic of the *Morbus Addisonii* as were those in the case of J. F. just read. She has been for ten days at a time in my wards of the Hospital and has been thoroughly examined. Now this woman, also, though very weak and listless, and suffering from frequent palpitation, yet shows no signs of anæmia; her mucous membranes and nails look quite bright and red, there is no cardiac bruit, and, under the microscope, the blood appears per-

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fectly natural. I might mention that in these microscopical examinations I have had the valuable assistance of my colleague Dr. Osler, and therefore, from his known skill and experience in this department, complete reliance can be placed upon the results obtained in both these cases. Thus I am convinced that, though anæmia is very common in Addison's Disease, yet that the essential pathology of this affection is not to be looked for in the blood. Prof. Pepper, in regarding this disease as of *hæmic* origin, has suggested that probably the marrow is at fault, as it certainly is in some of the special forms of anæmia. But, in our case, the marrow of all the long bones was submitted to careful microscopical examination and found presenting nothing but the usual healthy appearances.

Pains in various parts were much complained of. The principal site of these was across the abdomen, in the back, and down the thighs. In the female patient to whom I have just alluded similar pains have been felt for several months. For a long time, on one occasion, it occupied the region of the left sciatic nerve, and she was treated for sciatica.

Vomiting occurred very frequently, generally spontaneously, in an explosive sort of way, but sometimes came on as soon as he was made to sit up or to turn round in bed.

The physiognomy and *mental condition* were both very peculiar. The odd way in which he would whinge and half-cry when spoken to has been alluded to, as well as the puerility of his whole conduct. This state was to me very singular. I am not aware of having noticed anything exactly like it in any other disease. I do not find that this is specially noted in many of the collected cases of Dr. Greenhow, but the very first case of Addison's collection describes it exactly. He says: "the voice is puny and puerile, the patient speaking with a kind of indescribable whine, and his whole demeanor is childish." I would also remark here the way in which these symptoms abated to a great extent for a few days before his death. This was co-incident with improvement in almost all the symptoms. This tendency to *intermissions*, even in advanced cases of this disease, has often been noticed.

The temperature followed the general rule, of being almost constantly subnormal, although before his admission there was slight elevation of temperature, probably to be accounted for by some local inflammatory action.

As regards the *date of appearance* of the *discolouration*, in connection with the general symptoms, it was impossible to establish

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it very definitely. He was a coal carter, and consequently it would take a considerable degree of darkening to be appreciable through his normally smutty skin. But, as stated, I think from what we could learn, that he was ailing several months before discolouration began, which also would be in accordance with what has usually been observed.

His occupation calls for a word. He was a coal carter, and therefore much exposed to very heavy manual labor, and frequent heavy lifts and strains. According to Greenhow, the great majority of all cases occur in the lower and the hard-working classes; and he is inclined to attribute some importance to the fact, because he thinks that the disease may, perhaps, be often originated by some violent wrench or strain upon the loins.

The supra-renal capsules were in a stage very commonly met with, viz., that of extensive caseous deposit, with some softening—a sort of medium stage, not having advanced either to the completely-softened or puriform stage, nor to the still later cretiform stage, which is sometimes seen, with shrinking of the organ. They were surrounded by very dense and firm connective tissue. The exact connections of this, and the manner in which it involved the surrounding nerves, could not, I regret to say, be as carefully examined as I could have wished, owing, as already explained, to the somewhat peculiar manner in which the autopsy was originally performed. The view adopted by Dr. Greenhow, and very generally accepted, that the disease is caused in some way or other by involvement of large branches of the sympathetic and other nerves in an advancing sclerosis of the adjacent areolar tissue has, I think, everything to commend it. It is certainly the only theory yet given capable of at all explaining the peculiarities of this truly singular disease. One grave argument against it is that a great many cases have been recorded where no lesion of these nerves could be detected: this case adds one more to the number of these, for, though the branches going to the glands were carefully examined, nothing abnormal could be found.

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CASE OF PROGRESSIVE PERNICIOUS ANÆMIA.

CLINICAL REPORT.
BY
JOHN BELL, A.M., M.D.,
PATHOLOGICAL REPORT, WITH REMARKS.
BY
WILLIAM OSLER, M.D.
Professor of the Institutes of Medicine, McGill University.

J. B., aged 47, a native of Leicester, England, a rubber weaver by trade, and a resident in this country since 1857, came under my care in 1875, suffering from weakness and loss of appetite, which symptoms, with appropriate treatment and dieting, disappeared. In May, 1876, they recurred, and persisted more or less throughout the year. In February of present year his condition became such as to require constant medical attention. His history is as follows: He is a man slightly under the medium height, but well built, complexion fair, intelligence good, family history good; one brother suffers from dyspepsia, another is epileptic. He is married and has six children, all strong and healthy. For the first ten years of residence in this country he farmed, following at the same time the occupation of a shoemaker. Subsequently he came to Montreal, and for eight months was a conductor on the street Railway, during which period he enjoyed excellent health. For the rest of his life he served as a felt cutter for overshoes in the Canada Rubber factory. His general health had always been good. About three years ago the purchase of a piece of property some distance out of town, and the anxiety consequent upon making the necessary payments, caused considerable mental worry, and he suffered at the time from general debility. About the same time two of his children had a mild form of typhoid fever. The chief symptoms he complains of are excessive weakness and indisposition to exertion, together with loss of appetite. The skin is blanched; mucous membranes pale, sclerotics pearly, and he suffers from palpitation and shortness of breath on exertion. On physical examination the organs are apparently healthy; heart sounds natural; liver and spleen not enlarged; no enlargement of external lymphatics. No increase in the colourless blood

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corpuscles, but changes found in the red corpuscles, which will be noticed later on.

Ordered pill of reduced iron, grs. ii., and phosphorus $\frac{1}{60}$ gr.

March 14th. Has been depressed in spirits, and meditating suicide. Feels chilly, and has attacks of occasional vomiting, a murmur is audible at the base. Heart's beat feeble. Pulse, 104. Temperature, 99·5°.

17th. Vomited bile on getting up. Legs somewhat swollen; face puffy; complains of great weakness and shortness of breath, ringing in ears, and other signs of anæmia. Stopped the pills and ordered cit. of iron and strychnia. Temperature, 99·7. Pulse, 92.

22nd. Very little change. Bowels inclined to be constipated. Urine natural looking, no albumen; slight trace of sugar. Complains of indistinctness of vision. Sleeps well.

27th. Has been in bed since 24th. Hands and feet not so much swollen. Slight hacking cough. Feels too faint to sit up to have the bed made. Pulse and temperature about the same.

31st. Has had for two days vomiting and slight purging, which are now checked. Urine natural. Complains of numbness of left arm and hand. Vision impaired, sees peculiar coloured disks. Dr. Buller examined the eyes to-day and reports as follows:

Choroid unusually heavily pigmented, but apparently everywhere normal. Optic nerves pale, but not the pallor of atrophy, as there is no conspicuous absence of the smaller vessels which are always observable in the healthy optic papilla. On the surface of the right nerve the upper of the two small arteries which may generally be seen running transversely outwards towards the region of the macula lutea, present a peculiar appearance, the portion traversing the face of the nerve is much enlarged, somewhat fusiform, of a dark colour, like a retinal vein, but has not sharply defined walls. Just beyond the edge of the nerve this vessel is for a short distance almost normal in appearance, but further outwards it is obscured by a thin, superficial, streaky-looking extravasation of blood. The macula itself is occupied by an irregular dark red patch about half as large as the optic papilla, probably an extravasation of blood. There are a number of minute blood stains in the region of nerve and macula, nearly all of them thin and streaky, and generally close to some retinal vessel of moderate size. Some appear to be in intimate relation with the retinal veins, others with the arteries; they are all of the

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same dark venous colour. There is a slight haziness of the retina throughout the region occupied by extravasation, but apparently none towards the equator of the eyes. The arteries are decidedly paler and smaller than they should be in a state of health.

The patient speaks of seeing a dark spot about the size of a spectacle lens before the eye when he looks at any object, but thinks vision is not impaired.

The left eye was examined by the direct method only, and also showed numerous small retinal hæmorrhages similar to those described in the right eye. The region of the macula, however, was not minutely examined, the debility of the patient not permitting a more prolonged investigation.

April 4th.—Pulse 112, temperature 100.4°. Complains of tightness in chest, and pains in the head. Feels sick at stomach when he gets up. Numbness in both hands.

Feeling that he could not go on much longer, he asked to have transfusion performed, having been previously well instructed as to the chances of success, immediate and remote. The operation was accordingly performed on the 6th at 1.10 p.m., Dr. Buller kindly supplying the necessary amount of blood. I proposed transmitting the blood into one of the veins of the foot, but it was impossible to find one prominent enough, so that the median basilic of the right arm was selected. Ten ounces of blood were withdrawn from Dr. Buller, defibrinated by whipping with a wire egg-beater and passing through linen (lawn), the temperature being maintained by means of hot water. A v shaped incision was then made in the vein, and the nozzle of Aveling's transfusion apparatus introduced, and six ounces of blood pumped in without the patient exhibiting any uneasiness. The effect of the new blood was apparent in increased fullness of the superficial veins, a pinker color of the lips, and increased moisture of the skin. After removal of the nozzle from the vein it was found impossible to check the hæmorrhage by a compress, so that it was necessary to apply ligatures to both ends of the vein. It would have been better had these been placed in position before the vein was opened; as it was, one or two ounces of blood were lost. The operation lasted about ten minutes. Pulse at the time was 102, temperature 99.1°. Half an hour after he complained of feeling chilly, and the temperature began to rise; at the end of the hour rigors were well marked, accompanying every eighth or tenth expiration, and the temperature was 102°, the pulse 120, respirations 34. At the end of second

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hour the rigors had diminished somewhat. Pulse 132, intermittent and feeble; temperature 103.1°. About three hours and a half after the operation the temperature was 104.1°, the highest it reached. Pulse and respirations about the same. He takes brandy and beef tea alternately every fifteen minutes. Passed ℥ iii. of normal urine, containing no albumen. Until midnight the temperature remained about 103° and pulse between 140 and 150; they then gradually fell, and at 8 a.m. temperature 100°, pulse 100, respirations 28. He slept tolerably well through the night, passed ℥ viii of normal urine, and towards morning had a large healthy looking liquid stool, getting out of bed for the purpose. He says he is stronger, and his mind is clearer than before the operation.

April 7th.—The temperature continued to fall, and at 8 o'clock in the evening was 99°. Urine was passed three times during the day, and he had one stool in the morning. The pulse is firmer, fuller, ranging from 102 to 112, and does not intermit. Takes nourishment well, only vomited once.

April 8th.—Slept at intervals through the night, and took stimulants and nourishment well. Passed urine several times. Complained a little of pain in the right arm, and was restless towards day break. The temperature gradually rose from 99° at 7. p.m. to 101° at 7 a.m., the pulse ranging from 110 to 120. Respirations 25 to 30. From 7 o'clock the temperature and pulse gradually rose, till at 12 the former was 104°, the latter 130, and very feeble. Takes brandy and beef tea every ten or fifteen minutes, and dozes at intervals. Respirations 140 and shallow. After 12 o'clock he became very restless, and did not care to take nourishment. The pulse rose to nearly 150, the respirations became more rapid and very shallow, and the temperature fell to 102°. Breathing got more and more difficult, and he died at 1.40 p.m., about forty-eight hours after the transfusion.

AUTOPSY, TWENTY-FOUR HOURS AFTER DEATH.

Body that of a spare man, 5 feet 5 inches in height; complexion fair, hair light, whiskers red. The skin presents a yellowish tinge over the whole body, most marked on the face, neck, and shoulders. Rigor mortis well developed. Slight œdema of lower extremities. Four or five smooth white cicatrices on outer side of right leg. Freckles abundant on forearms. Panniculus adiposus thin.

Brain.—Skull unusually thick; marrow of diplœ red. About

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2 oz. of serum escapes on removal of the dura mater. Vessels of the pia mater empty. Pacchionian granulations numerous. Brain substance pale, of good consistence. Nothing abnormal in the ventricles or ganglia at the base. The remarkable pallor of the tissues is the most noticeable feature. Weight, 3 lbs. 3 oz.

Thorax and Abdomen.—The voluntary muscles exposed in the preliminary incision are of a rich dark red color. Intestines and omentum pale and bloodless; position of abdominal viscera normal. In the thorax the right pleura contains a pint of reddish serum, the left half a pint, in which a few floculi of lymph are seen. There are pigmentary (?) deposits upon parietal layer over diaphragm and bodies of the vertebræ.

Pericardium is normal, a few ecchymoses on visceral layer over left ventricle. *Heart*, very flaccid, walls of chambers collapsed. A good deal of sub-pericardial fat, especially over right cavities. Venæ cavæ nearly empty. Right auricle contains ʒ iss. of blood, light claret coloured, and one small coagulum, partly decolourized. Right ventricle contains a very small amount of blood; walls thin; endocardium stained. Valves healthy. Mus. papill. pale yellow colour. Left auricle empty. Left ventricle contains very little blood; lining membrane stained. Walls of normal thickness, muscle soft, somewhat paler than normal. Valves healthy. Aorta of normal diameter. *Lungs;* pigmentation moderate; slight congestion (post-mortem) in dependent parts, and also an excess of serosity. Structure healthy.

Spleen, slightly enlarged, weighs ʒ x. Numerous adhesions, infiltrated with serum, bind it to the diaphragm, stomach, and colon. On section pulp very soft, dark red in colour, almost diffluent. *Left kidney* (5½ inches long). Section shows a pale, coarse organ, somewhat softer than natural. *Left supra-renal capsule* pale, soft in the centre. *Right kidney*, moderately congested in the cortical portion and at bases of pyramids. Cones very pale. *Right capsule* healthy. Bladder healthy. Vesiculæ seminales contain spermatozoa. *Stomach* distended with gas; contains about 4 oz. of a brownish viscid fluid. Numerous ecchymoses along the greater curvature, especially at the cardiac end. The veins contain blood. Mucous membrane looks normal.

Duodenum and *jejunum* healthy. Coats of the *ileum* very thin, translucent, and anæmic. The solitary glands prominent in the upper part; only one patch of Peyer found in the lower portion. Large bowel normal.

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Mesenteric glands appear even smaller than natural.

Pancreas healthy. *Liver*, a few ecchymoses on capsule, a small cicatrix on upper surface of right lobe. Substance pale, in parts much softened. Weight, 3 lbs. 8 oz. Gall bladder contains normal-looking bile.

HISTOLOGICAL EXAMINATION.

The *blood* examined during life was very thin, watery, and of pale claret colour. It presented the following characteristics:—Colourless corpuscles appear perfectly natural in structure and size, and are not numerically increased. No large granular ones, such as described by Litten,[1] could be found. Two forms of coloured corpuscles: (*a*) ordinary forms, which are paler than natural, flattened out, less biconcave, and are very irregular in outline, some ovoid, others with sinuous borders, others again with pointed processes. (*b*) Small red corpuscles—microcytes,—erroneously described by Eichorst as pathognomonic of this affection. They were numerous, 8 to 10 occurring in the field of No. 9 im. and oc. 3. The diameter ranged from 1-5000″ to 1-9000.″ They equalled, or even exceeded, in colouration the ordinary forms; some were crenated, and they frequently presented a pit or cup-like depression on one side. In the repeated examinations of the blood, extending over three months, these forms increased but little numerically.

Schultze's granular masses were not noticed. No appreciable difference could be detected in the histological appearance of the blood an hour after the transfusion.

The *heart* presented signs of moderately advanced fatty degeneration, the striæ in many fibres being obscured by molecular fat and droplets of oil.

Spleen.—The normal elements, cells of the spleen pulp, and spindle-shaped corpuscles of the trabecula, together with numerous blood corpuscles, were the only structures noticeable in teased preparations.

Kidneys.—In both cortical and pyramidal portions the cells of the tubules appear very granular, somewhat swollen, and a large number of oil droplets are seen in and about the tubules.

Liver.—The cells contain oil drops in excess, and in many the nuclei are obscured. There is also some fatty infiltration.

The *marrow* of all the bones examined, sternum, ribs, vertebræ radius, fibula, was of a violet-red colour, of good consistence, and,

1 Berliner Klinische Wochenschrift, No. 19, 1877.

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with the exception of that of the fibula, contained no fat. There were found the ordinary large, coarsely granular, marrow cells, numerous small lymphoid corpuscles, and red blood corpuscles of both sizes; and, in addition, very many nucleated red blood corpuscles, corresponding with those described by various writers as occurring in the marrow in cases of leukæmia, and by Cohnheim[1] and myself[2] as constituents of this tissue in certain cases of pernicious anæmia. They were most abundant in the marrow of the sternum, fewest in that of the vertebræ. They were considerably larger than the ordinary red blood corpuscles and of about the same intensity of colouration. The majority had only one nucleus, but cells with two, three, and four were not uncommon. The position of the nucleus was usually eccentric, often, indeed, protruding half way from the corpuscle. The nuclei were colourless.

The disease which Addison was the first to recognize and describe as Idiopathic Anæmia has within the past five years excited an unusual degree of interest, owing, in great part, to the publication in 1872, by Biermer, of Zurich, of a series of observations upon a form of anæmia which he regarded as a new disease, and to which he gave, as marking the chief characters of the affection, the name "Progressive Pernicious Anæmia." Lebert had previously, about the same time as Addison, under the term "Essential Anæmia," described similar cases. Though, no doubt, long before Addison wrote, instances of this disease had been from time to time observed, still to him is due the credit of having given the first accurate clinical picture of the affection in his own inimitable way. Judge from the following quotation, which is given purposely, as his name has not received full justice in connection with this affection. He says: "For a long period I had from time to time met with a very remarkable form of anæmia, occurring without any discoverable cause whatever—cases in which there had been no previous loss of blood, no chlorosis, no purpura, no renal, splenic, miasmatic, glandular, strumous or malignant disease. Accordingly, in speaking of this form in clinical lecture, I, perhaps with little propriety, applied to it the term 'idiopathic,' to distinguish it from cases in which there existed more or less evidence of some of the usual causes or concomitants of the anæmic state. The disease presented in every instance the same

1 Virchow's Archiv, Bd. lxviii.

2 Centralblatt für die Med. Wissenschaften, Nos. 15 and 28, 1877.

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general characters, pursued a similar course, and, with scarcely a single exception, was followed after a variable period by the same fatal result. It occurs in both sexes generally, but not exclusively, beyond the middle period of life, and, so far as I at present know, chiefly in persons of a large and bulky frame and with a strongly marked tendency to the formation of fat. It makes its approach in so slow and insidious a manner that the patient can hardly fix a date to his earliest feeling of that languor which is to become so extreme. The countenance gets pale, the whites of the eyes pearly, the general frame flabby rather than wasted, the pulse, perhaps large, but remarkably soft and compressible.....there is increasing indisposition to exertion, with an uncomfortable feeling of faintness or breathlessness on attempting it; the heart is readily made to palpitate; the whole surface of the body presents a blanched, smooth, and waxy appearance; the lips, gums and tongue seem bloodless; the flabbiness of the solids increases; the appetite fails; extreme languor and faintness supervene, breathlessness and palpitation being produced by the most trifling exertion or emotion; some slight œdema is probably perceived about the ankles; the debility becomes extreme. The patient can no longer rise from his bed, the mind occasionally wanders, he falls into a half torpid state, and at length expires." With this classical picture the case here reported corresponds in every particular, the characteristic feature being the profound anæmia, shown by the pallor of the skin and mucous membranes, and the various functional symptoms of this condition, hæmic murmurs, etc.; no emaciation; progressive increase of all these symptoms in spite of medicaments which are effective in the ordinary anæmias, and, lastly, the absence, post-mortem, of any changes to account for the affection, bloodlessness and fatty degeneration of the organs being the only recognizable alterations.

Our knowledge of the etiology of the disease cannot be said to have advanced materially since Addison wrote. The very general fatty degeneration of the internal organs, by far the most constant and marked lesion, is to be regarded as a secondary change. The coarse and histological changes in the spleen and lymphatic glands, where, if anywhere, we should naturally expect to find alterations giving some clue to the failure in blood-making function, are not constant, sometimes they have been found slightly enlarged, at others atrophied. Indeed, so far as these organs are concerned, the numerous and careful observations

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of the past five years have failed to discover any definite lesion in them which would account for the symptoms, or in any way connect derangement of their function with the production of the disease. In one direction, however, there has been some progress, and to this we shall briefly allude. Clinically the cases present certain similarities to those of leukæmia and Hodgkin's disease, or pseudo-leukæmia. Now these latter diseases differ chiefly in this, viz., that in leukæmia the colourless blood corpuscles are in excess; in pseudo-leukæmia they are not. Both present three varieties: 1st the splenic, in which the chief lesion is the great enlargement of the spleen; 2nd, the lymphatic, in which the lymph glands throughout the body are mainly affected; and, 3rd, the researches of Neumann, Mosler, and others have made us acquainted with a variety known as the myelogenous or medullary, in which the marrow of the bones is the seat of disease. This tissue is now generally regarded as sharing, in the young animal at any rate, with the spleen and lymph glands in the formation of blood corpuscles. In the long bones of the adult it is in a state of atrophy, and its place, in great part, supplied by fat. In many cases of leukæmia and pseudo-leukæmia, it increases, becomes more vascular, its cellular elements multiply, nucleated red blood corpuscles, such as occur in the embryo, are formed, and the whole tissue passes into a condition of hyperplasia, strictly analogous to that affecting the spleen and lymphatic glands. This may be, as in a case recently reported by Mosler,[1] the primary lesion in leukæmia, and the development of the marrow may produce definite symptoms, such as swelling and tenderness of certain parts of the bones; so that the myelogenous forms of these affections are now well recognized. Clinically the myelogenous form of pseudo-leukæmia, though rarely uncomplicated, presents such a similarity to pernicious anæmia that Jaccoud,[2] and Immerman[3] suggested the identity of the two affections, while Prof. Pepper,[4] declared distinctly that pernicious anæmia was "merely the simple medullary form of pseudo-leukæmia."

As I have quite recently, in commenting upon another case,[5] referred fully to the facts for and against this view, I need not

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1 Berliner Klinische Wochenschrift, Nos. 50, 51, 52, 1876. 2 Nouv. Dict. de Méd. et de Chirurg. Leucocythémie. 3 Ziemssen's Handbuch der Speciellen Pathologie and Therapie, Bd. xiii. Art. Pro. Pernic. Anæmia. 4 American Journal of Medical Sciences, Oct., 1875. 5 Canada Medical and Surgical Journal, March, 1877.

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recapitulate them here. In the present state of our knowledge it may, I think, be reasonably affirmed that certain cases of idiopathic anæmia may be placed in the category of myelogenous affections, and among them the one here reported. To many it may appear far-fetched to seek in the altered condition of the bone marrow an explanation of the extreme anæmia of this disease, but the reports of numerous cases leave no room for doubt that a serious alteration in its structure, and a return in adult life to its embryonic state, may profoundly influence the composition of the blood, producing anæmia and death. It must be borne in mind that the red marrow in the short bones of an adult probably equals in bulk the constituents of the spleen, and structurally is very similar to that organ and to the lymphatic glands. In the long bones it is largely replaced by fat, but traces of it still remain. Now, granting that the marrow is a tissue which shares in the blood-making functions, it is quite as reasonable to suppose that, if hyperplasia of the elements of the spleen can lead to serious disturbance in the composition of the blood, producing the splenic form of leukæmia or pseudo-leukæmia, according as the colourless corpuscles of the blood are increased or not, so a general increase of the constituents of the marrow may induce similar conditions. For it is to be remembered that, in a general hyperplasia of the marrow, the actual amount of lymphoid tissue in the osseous system equals or perhaps exceeds that of an enlarged spleen. Why a simple hyperplasia of this tissue should interfere with the elaboration of the blood, altering in the one case the mutual proportion of the corpuscles, and in the other simply reducing the total number, we do not know, but we are just as ignorant why an enlarged spleen and lymphatic glands should produce in the one case leukæmia and in the other not.

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CASE OF SUPPOSED GUMMY TUMOUR OF THE BRAIN.

REPORTED BY

A. PROUDFOOT, M.D.

In December last Mrs. C. brought me her little girl, three years of age, who complained of a noise in the head, which she referred to the right ear. The child, though not very robust, was at the time apparently in the enjoyment of pretty good health. Upon examining the ears I found nothing abnormal in the appearance of the membrana, nor was there any deafness of either ear. I therefore considered the case one of ordinary tinnitus, and as the child's appetite was not good, I prescribed a tonic and told her mother to let me see her again when the medicine was finished. In January, one month after her first visit, Mrs. C. again brought her little girl to me, stating that she had given her the medicine, but the child had grown gradually worse. She then informed me that the noise could be heard by placing the ear upon the right side of the head, and that she had noticed a similar one, when the child was only a year old, while lying with her head on the same pillow. Upon placing my ear to the child's head, a loud aneurismal soufle was heard over the whole of the right side; but was at once controlled by pressing the finger upon the right common carotid artery. The aneurismal bruit was of a very high note, and synchronous with the heart's action. The child's health had suffered considerably since I last saw her, she was pale and extremely irritable in temper, the pupils were moderately dilated, and the eyes had a somewhat staring appearance; the tongue was coated with a white fur, the bowels constipated and the appetite very poor. The pulse was about 110. The child walked with difficulty, becoming fatigued upon very slight exertion; and cried occasionally with a pain in the head. I ordered good nourishing food, milk, beef tea, and eggs, and put her upon a tonic of iron and quinine, and a mixture containing three grains of the bromide of potassium three times a day. This treatment was continued for a month, until February 14th, with the following changes in the symptoms: the child was more fretful and walked with greater difficulty, having a stum-

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bling gait, as if she were about to fall forwards; the pain in the head was more frequently complained of, and the aneurismal murmur was audible without placing the ear in contact with the head, and of a whistling character. Believing that in so young a subject these symptoms were more apt to be due to some pressure upon an artery than to an aneurism, I thought it not impossible that a gummy tumour of the brain might be the cause of the trouble, especially as the general appearance of the child, and a malformation of the teeth, indicated a specific taint, though her parents denied anything of the kind. I therefore continued the tonic treatment, and combined the bromide and iodide of potassium in doses of 2½ grs. each, three times a day, with an occasional grey powder. Under this treatment a decided improvement took place, so that by the 20th of April the murmur had almost disappeared, and on the 30th, when I examined her, I was unable to distinguish the slightest bruit myself, and the child stated that the noise was gone. I advised her mother to continue the treatment for a time, and when I saw the child in May, and again in June, she was apparently in the enjoyment of good health.

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ON THE USE OF ACETATE OF LEAD, IN LARGE DOSES, IN POST-PARTUM AND OTHER HÆMORRHAGES.

BY

JOSEPH WORKMAN, M.D., TORONTO.

It is now nearly fifty years since a discovery was made by my preceptor, the late Dr. John Stephenson, of Montreal, which was regarded by him, and, as I think, very justly, as a very important therapeutic fact. About the year 1830 Dr. Stephenson was consulted by a man who was troubled with a varicocele. With but meagre expectation of doing his patient any good, he gave him a dose of epsom salts as a purgative, and two drachms of the acetate of lead to be used as a lotion on the scrotum. He did not again see the man for some weeks. Meeting him one day on the street he enquired how he had got on. The man replied he was cured. Dr. Stephenson was rather sceptical as to this favourable issue, and questioned him as to the effects of the two drugs. He replied that he used the large powder as a lotion, and dissolved and swallowed the other. It was very sweet, he said, but it purged him well. Dr. Stephenson afterwards examined the scrotum, and found that the varicocele had really disappeared. He was a man of sharp perception and rapid conclusion. He had twice nearly lost a lady from post-partum hæmorrhage, though using all the suppressive means then in favour. He resolved to try, in her next confinement, should hæmorrhage recur, the effect of a large dose of the acetate; but not to wait till it had set in. He gave it some time before the emptying of the uterus; and to his high satisfaction the organ contracted promptly, and no hæmorrhage took place. In every subsequent labour of this lady he took the same precaution, and it was followed by a like result. Throughout his obstetric practice, which was pretty large, he treated every severe case of post-partum hæmorrhage with the acetate, generally in drachm doses, repeated if deemed necessary. Not in any instance did the slightest evil follow.

Shortly after his first test of its anti-hæmorrhagic action, a servant man of the late Professor Holmes was seized with a

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formidable hæmoptysis. He was placed in the Montreal General Hospital. The hæmorrhage resisted all the remedies prescribed by the attending physician. A consultation of the Hospital Staff was called. Dr. Stephenson related his experience of the efficacy of the acetate, and proposed it in this emergency, but none of his colleagues would venture on his large doses, for they had all been taught, and as in duty bound they all believed, that it was an irritant poison. The patient, however, was bleeding to death, and they yielded, but at the same time told Dr. Stephenson he must take the entire responsibility on himself, which he most readily and fearlessly did. I do not remember the total quantity of the acetate which was given to this patient, but I know it was large, several drachms in the course of a few hours. The man's life was saved. Some years after I saw him in Dr. Stephenson's office. The Doctor sounded his chest, and showed us that one lung was sealed up.

Dr. Stephenson, in his midwifery lectures, strenuously inculcated the theory of the anti-hæmorrhagic action of the acetate, and its perfect harmlessness in large doses. I have been a faithful disciple, both in my general practice, and as a teacher of obstetrics; and I am aware that a number of my fellow students, and nearly all my pupils, have realized the same valuable results as Dr. Stephenson and myself. I could corroborate this statement by many witnesses, some of whom now hear me. I think I may safely appeal to one of my fellow students, whose testimony will command the warm respect of this entire Association, need I say that I mean our venerable and most sincerely esteemed Secretary? Alas! he is, I believe, all that now remains to me, in this city, of my contemporaries; you will not, therefore, wonder that I both esteem and love him.

I never but once saw the slightest sign of the evil constitutional results of the acetate, and that one exception occurred in a case of hæmoptysis, in which my consulting friend would not consent to exceed five grain doses, and these he insisted on guarding by one grain of opium with each dose. As the case was his, and I could not dissipate his fears, I did not feel called on to contend against his scruples. In due course the peculiar lead gum put in appearance. The acetate of lead given in its pure state, in large doses, not only requires no opium as a protective against its action, but it is my conviction it is always unwise to aim at any such protection; and in this

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relation I would also inculcate the inadvisability of the addition of acetic acid. I pretend not to go into the chemical merits of the question, but it is my impression that this addition of acetic acid is more likely to favour undesirable chemical transformation than to prevent it. I am, however, quite sure that no such precaution is necessary. I always took care to use a pure sample, free from any portion of the carbonate; but even should some portion of the latter be present, as it is insoluble in water, it soon falls to the bottom of the solution, and then we are perfectly safe in giving the clear fluid.

I remember one case of very profuse lung hæmorrhage in which I administered within twelve hours six drachms. The man was saved, and he lived several years after, but finally died of pulmonary phthisis. I gave eight drachms in the course of sixty hours to an asylum patient. In neither of these cases did any lead symptoms, nor, indeed, any other unpleasant result follow. 'My asylum patient survived her hæmorrhage three years, and died of phthisis also.

I was rather surprised, if not a trifle mortified, to find that, in a total of perhaps one hundred and forty students of the two Toronto medical schools examined by me on obstetrics last April, only one gave, amongst the multifarious suppressors of post partum hæmorrhage, the exhibition of large doses of the acetate of lead, whilst dozens named it in paltry doses, guarded by acetic acid or opium. At Kingston, however, where midwifery is taught by my old friend and pupil, Dr. Lavell, I found a very different state of matters, and I felt I was not yet utterly ignored.

Not long ago a very clever medical friend, when discussing with me the merits of the acetate in post-partum hæmorrhage, exultingly asserted that before it could come into action the woman would be dead. My reply was, "I am convinced you have never tried it in large doses;" and neither had he. So far from slowness of action being the fact, I have often been astonished at its quickness. More especially have I observed this when it has been speedily vomited. The uterus has appeared to me to shrink down into normal globular form, almost instantly. I do not believe we have, in all our materia medica, a more prompt, or potent promoter of uterine muscular contraction.

Why, in the name of Heaven, we should deluge a poor shivering woman with pailfuls of iced water, or inject into the uterus such irritants as the tincture of chloride of iron, when we have at com-

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mand so harmless and efficient a suppressor of hæmorrhage as the acetate of lead, is quite beyond my comprehension.

A few days ago, in a conversation with my respected asylum successor, Dr. Daniel Clark, President of the College of Physicians and Surgeons of Ontario, I requested him to state his experience in the exhibition of the acetate in uterine post-partum hæmorrhage, and to inform me in what doses he had given it. His reply was that his usual dose had been a teaspoonful, its action had been prompt and efficient, and he had never seen any collateral result more remarkable than vomiting, in exceptional instances; but an invariable coincidence of this symptom was the complete contraction of the uterus.

Dr. C. has been even more heroic in his doses than Dr. Stephenson or myself. I more generally gave half a drachm than a whole one, repeating this when deemed necessary.

Another of my old pupils some years ago informed me that his dose was two drachms.

I believe it will generally be found that in these large doses it acts as a moderate purgative within twenty-four hours; and, if it be desirable that, in order to avert transformation, it should be expelled from the bowels in this way, it may be better to err on the safer side, which certainly is *not* its exhibition in *small* doses.

I trust, gentlemen, you will not for a moment suppose that I inculcate the employment of this medicine in every case, however trivial, of uterine hæmorrhage, though I am firmly convinced of its harmlessness. You all understand too well the efficient mechanical means of inciting uterine contraction to imagine that where these are adequate to our purpose, I would employ uncalled for supplementary means.

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VITAL STATISTICS.

BY

A. B. LAROCQUE, M.D.,

HEALTH OFFICER, MONTREAL.

This Convention, by bringing together the more prominent members of the medical profession of the Dominion and a certain number from the United States to discuss medical subjects, not only tends to elevate the standard of our profession but also to *ameliorate the condition of society.* I could not allow this opportunity to pass without laying before this enlightened meeting subjects which, although familiar to you, are of such importance as always to require your greatest consideration, I refer to Hygiene, Vital Statistics and Sanitary Legislation. On account of the many other important subjects which will have to be treated, I shall confine myself to a few general observations.

A great deal has been said and written about hygiene, but competent authorities have neglected to take the measures necessary to apply the principles of this science in order to benefit populations. Unless hygiene is recognized as it ought to be, civilization will never obtain the desired end, that is to say, the physical and moral welfare of society. We cannot deny, however, that modern hygiene and medicine have greatly contributed to diminish the many causes of disease which seem to multiply in proportion to the increase of population.

The millions which charity has lavished upon our modern institutions in order to alleviate the sufferings of humanity have constantly had a tendency to prolong the mean of life. Modern hygiene has been inspired by these words of Christ, "Come unto me, all you that suffer."

Modern hygiene contrasts forcibly with ancient hygiene, which was based upon pagan philosophy, and which approved of destroying the sickly and infirm. We know that Plato says in his Rep. B. 5, that we should be careful to nourish children born of healthy parents and neglect those of the weak. Illorum prolem nutrire, horum minime. Aristotle (Polit. B. 7, p. 16) says: "In order that weak and infirm children may not be nourished, the law ought to prescribe that they be exposed or be done away with."

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Ancient civilization was materialistic, and had for its object the perfection of the physical faculties, the triumph of material force. Christianity, on the contrary, declares war to the instincts of organized animal matter.

In Europe within the last two centuries the sanitary condition of the different countries has been greatly improved and the mean of life lengthened. But with what slowness has sanitary science progressed! It has taken centuries to increase the mean of life a few years. It is true that the labouring classes in Europe are now in as good a sanitary condition as the gentry were a century ago, and that epidemics do not prevail to such an extent as formerly, but can we say that hygiene has progressed in the same measure as other science? If it had, we should not have to deplore so many deaths by diseases the causes of which could be greatly diminished by proper means of prevention.

France, although a country in which the importance of the science of public health was recognized as early as the thirteenth century, and which up to the present has earnestly endeavoured to bring that science to the highest degree of perfection possible, has still many improvements to make in connection with departments of public health under the administration of the government. In the departments of the Rhone and Gironde where 600,000 fr. are annually spent, the children in the nurseries die at the rate of 80 to 95 per cent. Two years ago, when the government was inaugurating the works of "Le Jardin des Plantes," made to ameliorate the condition of animals, it prided itself upon having spent $100,000 for this object, whilst, at the same time, it boasted of having economized as much in the system of nurseries.

The mortuary statistics of many of the large cities are not always correctly compiled. For instance, in 1875, according to the table showing the civil state of the City of Paris, there were 55,313 births and 50,245 deaths, giving an excess of 5,068 births over deaths; but of 20,000 children born and registered yearly in Paris, and sent to the different departments to be nursed, 10,000 die, giving 55,313 births and 60,245 deaths, an excess of 4,932 deaths over births.

The scientific world, and especially the medical profession, has endeavoured to propagate the benefits of hygiene, but governments and municipalities, deaf to such teaching, have always neglected to apply it. One of the reasons that hygiene has been so very little popularized is that amongst men the study of

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man has been neglected. Strange to say, man, born to learn, in his thirst for knowledge scrutinizes the physical and metaphysical world, and devotes himself to the study of all sciences but that having for its object the knowledge of himself. The consequence of such an error of the human mind has been to create a false civilization which has a tendency to lead man astray. It seems that when man concentrates his thoughts in order to study himself, he sees so many contradictions in his nature, that he becomes frightened, so to say, and shuns the consideration of his own self; or else if we study man we do not do so in accordance with the nature of his being. Philosophy seems to have had an imperfect knowledge of man, the consequence being that it led to an exaggerated spiritualism, or to materialism the tendency of which was to destroy the most noble aspirations. To spiritualists, the mind, although mysteriously united to the body which serves as its instrument, seems to have an existence altogether separate from it, depending upon it simply to receive impressions of external objects in the execution of its different operations. To the materialist, man is nothing but a thinking machine, his acts being entirely determined by his constitution or temperament, modified according to the circumstances in which he is placed and which he cannot control. Free will is for him an illusion. The mode of action in each individual is simply the result of the reaction of the brain on the impressions which cause it to operate. Man by his body is in relation with the sensible world, supplying all his physical wants; but if he resembles the purely organic and instinctive beings by the nature and play of many of his organs, he is, nevertheless, the king of the sensible world by his cerebral organization and the nature of his soul. We recognize in man a physical, an intellectual, a social, and a religious life, four states of existence, which may be considered under different relations, but which cannot be separated one from another, for they constitute but one and the same life, having different wants which, exercised within legitimate bounds and according to the sanitary, social, and religious code, tend to but one end, his happiness; for the body it is health, for the mind, reason, and for the soul, spirituality.

Hygiene, based upon true physiological and well understood Christian principles, studies man in his true nature, that is to say, as being composed of material and immaterial substances, the harmony and the reciprocal action of which tend to the highest state of perfection. This science has for its object not only to

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guard humanity against disease, but also to develop the physical and intellectual, social and religious faculties of man in his individual as well as in his social life. It is by popularizing this science that civilization will be established on such a basis as will insure the welfare of society. To attain this end hygiene ought to form part of every system of education. It is also a science indispensable to political economy, to social questions, to industry, and even to the study of theology. From the want of this science in our systems of education we often, unfortunately, develop the mental faculties at the expense of the physical; the consequence being that the mental faculties are weakened and thus we are far from attaining the object desired. It is astonishing that legislators who are not instructed in this science should pretend to be able to legislate wisely for the welfare of the community. It is true that governments adopt measures that tend to the prosperity of the country—large sums are spent to build railways, to improve agriculture—special attention is paid to improving the different species of animals. At exhibitions, prizes are paid to those who raise the best horses, cattle, etc., and, indeed, if we travel through the country, we are pleased to see the splendid breeds of horses and other animals, but at the same time it is painful to know how little is done to ameliorate the condition of the human race. We too often see sickly and emaciated children and debilitated adults, indicating a low sanitary condition of the population, owing to bad drainage, impure water, improper food, want of ventilation, over crowding, &c. We know that at times contagious diseases prevail, decimating populations, especially the infantile portion, without the slightest notice being taken by the ruling powers. If young animals were destroyed at the same rate we should, no doubt, hasten to take the necessary steps to discover and do away with the causes. We forget to consider that were we to protect the lives of so many children they would become valuable and profitable hereafter to the country. The rules of hygiene ought to be observed in industrial establishments, for if we wear objects of luxury and costly apparel it ought not to be at the expense of the health of our fellow-creatures. In theology hygiene is indispensable. Religious sentiments ought not to be developed at the expense of the other mental faculties, for instead of performing that which is required by pure morals, individuals might be led to follow that which is suggested by the idol of an exalted imagination.

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We can only apply the benefits of hygiene to the welfare of a population by demonstrating to governmental and municipal authorities, by means of a complete system of statistics, the ravages caused by disease, especially those of a contagious character most of the causes of which are preventible. The causes of the excessive mortality among children might thus be made known and studied. At certain periods governments compel the census to be taken, in order that the number of persons forming the population of a country may be known; but vital statistics have, besides, the advantage of making known the physical and moral condition of populations in relation to climate, nature of soil, alimentation, social habits, and, we might say, the literature, and even the form of government and religious teaching. In every civilized country the science of vital statistics has been recognized as indispensable in making known exactly the movements of populations. In England there are two institutions of the highest importance; a special ministration which, under the name of the Registrar's office, gathers all the materials of vast medical statistics, which are regularly compiled and published; and the General Board of Health, established in 1848 by Act of Parliament, which is authorized to institute sanitary enquiries into the condition of all cities where the mortality exceeds 23 per 1000, and to ordain such preventive measures as are necessary. The result of the application of sanitary measures in England was to reduce the death-rate in several cities and towns from 32 to 24 per 1000. And the last Act of 1875 is calculated to insure the greatest security to public health. Thousands are annually spent to ameliorate the sanitary condition of the country, and epidemics make less ravages there than in other lands. Thanks to a most perfect system of registration, which has enabled the government to put into operation a thorough system of vaccination, Great Britain has suffered much less from small-pox than the other countries of Europe. The mortality from this disease was from 5·9 to 12 and 14 per 1000 in Holland and Prussia, whilst in the cities of Great Britain it was only from 2 to ·82 or ·90 per 1,000. According to the Artizans and Laborers Improvement Act, the health authorities of England have the power to demolish unhealthy habitations. In 1875, in one of the districts called Whitechapel, the health officer found a space covered with lodging-houses altogether uninhabitable. It was proved by him that the area on which were erected 444 houses, containing 4,350 occu-

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pants, comprised but 6¾ acres. In some of the courts there were only 3½ square yards allotted to each individual. The mortality in this locality varied from 38 to 48 per 1000, whilst in other districts it was only 23 per 1,000. The following plan was adopted when the 6¾ acres were vacant: habitations were built on a space of only 3½ acres, which could contain 3,600 persons, that is to say, 750 less than before. The rest of the ground was reserved for streets and places of recreation.

In the United States hygiene was confined to comparatively few localities. In 1866, a sanitary metropolitan district was constituted, comprising the counties of New York, King's, Westchester and Richmond. The result was that in one year 3,152 lives were saved in the City of New York notwithstanding the increase of population. Several other states have organized Boards of Health, and we have only to read their reports to be convinced that they have attained great success, although in many places complaints are made of not obtaining complete systems of registration, especially of births. They have been for some time agitating for the establishment of a Central Bureau of Sanitary Science at Washington.

Amongst the countries that pretend to any degree of civilization, the Dominion of Canada has advanced the least in sanitary science. Up to the year 1875, the only Act passed concerning public health was that relating to epidemics whilst prevailing. It is well to remark that, in 1875, a Committee of Hygiene, appointed by the Quebec Legislature, presented a report, recommending compulsory vaccination throughout the Province, which was adopted. A law to regulate burials was also passed at that time, but no organization was formed to put those excellent regulations into force. The following year Dr. Larue, President of that Committee, obtained a registration law, obliging all those keeping public registers to forward to Quebec, according to a certain form, an annual return of births, marriages, and deaths. Religious denominations who do not baptise, to register births in their respective municipalities at the office of the Secretary-Treasurer.

The health authorities of Montreal have adopted a code of sanitary by-laws, which, although not perfect, will be made more so as the want of sanitary legislation is felt. The great obstacle to the application of sanitary reforms is the opposition to submit to sanitary regulations, especially to those which have reference

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to contagious diseases. The power to enter a citizen's house to give such instructions as would not only prevent contagious diseases in families where they prevail already, but also protect neighbours, and in fact the community in general, is considered as an infringement of the liberty of the subject, as if by liberty citizens would be free to do within their own premises whatever might endanger public health. To a reflecting mind, true liberty is obedience to such laws as would insure the safety of the community at large, should it even require individual sacrifice. To protect all classes of society sanitary law sought to be enforced; care, however, should be taken to confide the execution of such laws to prudent, self-possessed, and well-informed officials. Although Montreal is not so far advanced as other cities on this continent, yet praiseworthy efforts have been made by the Municipal Council to promote public health. A Board of Health has been in active operation for a period of about four years; and when our esteemed President, Dr. Hingston, was elected mayor of this city, he succeeded in creating such a Board, which, by constant efforts, laid the basis of the different departments which ought to constitute it when regularly organized. Last winter the Board was re-organized, and is now composed of nine aldermen and nine citizens, six whom are medical men. A council of that Board has been lately named to superintend the daily working of the health department. This council has now under consideration the best means of placing the statistical department on as good a footing as possible; also the adoption of a permanent and efficacious system of vaccination. An obstacle to a statistical organization is the difficulty of obtaining the necessary information as regards the causes of deaths, the law allowing parents or friends to certify the cause. In consequence of this we receive certificates giving little or no information. "Headaches, or Lesions to important organs of life," are often given as causes of death. In medical certificates also the cause of death is often indefinite, hæmorrhage, syncope, debility, &c., being frequently given. The certificates of death are not directly received at the Board of Health. They are sent in once a week with the mortuary lists from the cemeteries. As to births and marriages, the civil law of the Province of Quebec requires that all those who keep ecclesiastical registers shall be obliged to send in yearly returns of the baptisms and marriages to the prothonotary of every municipality in the Province. During the last session of

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the Quebec Legislature I had prepared amendments to that Bill, which were approved of by the Council of the city. The object of those amendments was to divide the Province of Quebec into two sanitary districts, all information to be sent in to each centre once a month, in order that quarterly reports might be made, to show the sanitary state of the different municipalities of the Province. No doubt but that, by making known through such a system the ravages of contagious disease, we should succeed in persuading the Governmental and municipal authorities of the Province of Quebec to adopt such sanitary legislation as would put a stop to the prevalence of those epidemics. This system would also enable us to obtain a regular system of registration of births, which would favour a permanent and efficacious system of vaccination, as in England.

The most important question in vital statistics, is whether the system should be under the control of the Federal or Local Government. Such statistics are the basis of sanitary organization, and the means of preparing the population and ruling powers for sanitary legislation. It might be more economical to have it under the different Provincial authorities, and also more effective, as each Province would know its own requirements. But I would insist on the establishment of a central Bureau of Sanitary Science at Ottawa (which would entail comparatively little expense) to which annual reports from each Province should be sent.

Four years ago I presented to a committee of medical men, members of the Federal Legislature, a report recommending the appointment at Ottawa of a Central Bureau of Sanitary Science—the object of which would be to compile and publish vital statistics and to favour the establishments of Boards of Health at least in the municipal cities of the Dominion.

The report was adopted by the Federal Legislature, but no action taken. I therefore beg to suggest that a committee be appointed to inquire into the question of vital statistics, and to prepare a plan to be presented to the Government.

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PAPERS IN THE SURGICAL SECTION.

VARIOUS WOUNDS AND THEIR TREATMENT.

BY

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(Of the General Hospital Staff, Toronto.)

INTRODUCTION.

The treatment of wounds is at the present time receiving no little attention; and numerous and varied experiments with much activity of thought have been productive of unusual modes of practice. Anything which may contribute to the more effectual and speedy healing of wounds should without hesitation be presented to the medical public. And it is with the hope of adding a little to the general store that this paper is written.

CLASSIFICATION.

Wounds are variously classified, as, for instance, into incised, lacerated, contused, and punctured; also, into wounds of the head, face, neck, chest, abdomen, extremities, &c. We have also external and internal wounds. These classifications are not without importance, and they are valuable in indicating the proper course to be pursued in different cases. While there are certain general principles to be always observed in the treatment of every form of wound, each one requires specific attention according to its nature and position. Another division may also be mentioned, namely, into healthy, and unhealthy. The unhealthiness may be due to a vitiated constitution, or it may arise from some local cause.

I. Let us first regard a healthy wound upon the surface of the body. It has been made by a sharp cutting instrument; the tissues have been divided without the contiguous structures being injured, at least sufficiently to affect their integrity. Consequent upon the solution of continuity, the minute nerves of the part are suddenly exposed to unwonted influences. They have not only been divided but they are exposed to a different temperature, as well as to contact of materials, as water or the sponge. The effect of this is irritation, which, by well understood physiological laws, leads, shortly, through reflex action, to a more active flow of blood to the part; but the smaller vessels which were divided have become closed by a natural process we need not here describe. The active congestion around the wound at once becomes a source of effusion; and, with more or less rapidity, the surfaces of the wound are coated with plastic lymph. It is a fact well established

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in surgery that, under favourable circumstances, the divided surfaces will, with little delay, unite together, restoring the part to its natural state. Now, what are the conditions essential to secure this result? Is it the exclusion of air. Or the destruction of organisms inhabiting the air which may have lodged upon the part? If the air surrounding the wound be impregnated with a specific poison, as that of erysipelas, it will be a formidable obstacle to the healing process; but ordinary air, even that of most hospitals, (certainly in a place with fair ventilation,) will neither prevent nor interrupt the work of repair. What then is requisite? Foreign substances are removed, bleeding has ceased, there remains the necessity of joining the surfaces of the wound; and, what is not the least important, the *perfect maintenance* of the union. Anything which will disturb the freshly joined surfaces will interfere with the healing work; but if perfect rest be secured for a sufficient length of time, whereby the wound in its length and depth is made immovable, the plastic material upon the surfaces is changed into a firm bond of union, and is ultimately developed into the natural tissues by the processes of nature, provided always that the circulation of blood in the part is normal. We will now consider a wound clean cut, where there is so much loss of tissue that the wound cannot be closed. What do we observe, when no dressing at all is applied? If the part wounded is so placed as to insure natural circulation of blood in the contiguous tissue, the fibrinous material is poured out upon the wound, the sensitive nerves are coated and thus placed in a condition resembling the natural state; and when no longer irritated they cease to be the means of bringing an extraordinary amount of blood to the part. So long as there is any irritation, there will be an excessive supply of blood. As the irritation subsides and finally ceases, the circulation decreases and then becomes normal; yet is adequate to nourish the tissue and construct a new fabric to fill up the breach. To establish this condition of the wound but little protection is required. But when water, or spray, or lint, or any other tangible material, is brought into contact with the open wound, irritation is the result. In the absence of irritation it is remarkable how admirably the work of repair is carried on and suitable protection supplied by nature. We have seen that the lymph had clothed the exposed nerves; but this coating is intended for another purpose, it is to be the agent of repair. The serum of the liquor sanguinis flows away; and the fibrin gradually stiffens, and, as it

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coagulates, it contracts. This layer of fibrin undergoes a certain development, and forms a framework in which is built up the natural tissue. As a general thing, in consequence of the absence of perfect rest of the part, there is more lymph supplied than can be appropriated. This surplus material, possessing vitality, does not at once perish, but, failing to take part in the work of construction, it soon degenerates, and the result is the formation of pus. Therefore, when irritation of the nerves, from any cause, continues, the more abundant flow of lymph is followed by a corresponding quantity of pus. To illustrate: take a wound of the scalp; when the divided integument is brought together the union is usually rapid, and when union by adhesion fails, the formation of pus is limited. The writer has seen, after the whole scalp was torn off, very little suppuration under water-dressing at any time. Why is this? It is because there is no motion of the surfaces of the wound. The firm skull and the close-fitting scalp secures that complete repose which is the prime requisite for the healing process. On the contrary, take a wound of a limb, or any part subject to the action of voluntary or involuntary muscles, and, with the same extent of wound, there is ordinarily far more suppuration, unless the most elaborate means be adopted to prevent motion. Continued, or frequently repeated movement of tissue will not allow the healing to proceed. We have the same fact demonstrated when an abscess has been emptied in close proximity to the sphincter ani. Instead of healing from the bottom a fistula results. But other causes may prevent healing in a wound primarily healthy. First the *position* of the part wounded may be adverse to the work of repair. To have a perfectly normal healing process, a due and uniform supply of arterial blood is required. If the arterial flow be too great, the reparative material, instead of being erected into tissues, is converted into pus. Again, if there be not an even flow of blood *from* the part there will be a state of *passive congestion*, and the tissues will become infiltrated with serum, and the capillaries distended with a sluggish or partly stagnant stream of venous blood. In such a state the arterial blood cannot reach the borders of the wound, and the tissue, weakened and devitalized, is not in a condition to impart the necessary vitality to the granulations. The result is a weak ulcer, with tall, imperfectly developed granulations, commonly called *proud flesh*.

This passive congestion is often the result of a dependent position of the wounded part, or it may be the effect of a badly

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adjusted bandage. A not uncommon local cause of unhealthy healing in a wound is erroneous treatment. It is emphatically a true doctrine that nature is adequate for the work, (when unhampered) of repairing tissue (where restoration is at all possible) in all cases of incised wounds, without any local medication, either to give vigour to the tissue, or prevent the approach of airborne enemies. All are familiar with the saying that "Nature, when unadorned, is adorned the most," and we may say, in like phraseology, that Nature is most aided in the healing of wounds when most let alone. Not that the surgeon has nothing to do; but he is not to meddle unnecessarily with the wound itself. While he should give it protection, he must not disturb the healing surface, or remove the bland covering of pus which bathes the delicate granulations. Sometimes this pus dries into a scab beneath which the new fabric is speedily completed, the scab serving to support and keep at rest the granulating surface.

But, on the contrary, the pus sometimes quickly ceases to have vital properties, and after perishing, begins to decompose, or putrefy. Here, at once, we have, in contact with the granulations, a potent animal poison. What, however, is the usual cause of this putrefaction in a previously healthy wound? Speaking from observation we say it is very often the result of improper dressing. Applications of lint and bandages have been made and continued until the pent up fluid oozing from the wound has, in consequence of the warm stagnant air, begun to undergo putrefactive change and decomposition. Let a wound found in such a condition be freely exposed and the offensive material thoroughly removed by washing with pure water, and then be left with no immediate covering, and in a few hours it will assume the features of a healthy sore, and will begin to granulate. It was the pent up air, acting chemically upon dead organic matter, with a favourable degree of heat and moisture, which produced the putrefaction. The application of pure water and the presence of fresh air wrought this salutary change.

The indications, then, for the treatment of incised wounds are very plain and simple; and we care not where the wounds may be situated, even in joints, to follow these indications is to aid, not to thwart, nature in her work of repair.

Rest, position, cleanliness, the use of pure water to remove dead animal matter, and *fresh air* are the requisites for successful treatment. To carry out these indications a diversity of means may

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be employed according to the place and character of the wound. By rest, it must be remembered, is meant not merely repose of the body and limb, but, also, a perfectly quiescent state of the tissue around the wound. To secure this rest of the tissue wounded, support by bandage or other appliance, is sometimes employed. But the objection to most of these is the rapidity with which they become impure, and the impossibility of removing and renewing them without disturbing the healing process. Adhesive straps, with or without compresses, will often be more useful. But other means are now-a-days used which, although applied on certain special principles thrust into prominent notice, answer very well to secure cleanliness and rest. The so-called antiseptic method is well adapted to meet the requirements in these particulars. It is not by destroying or warding off air germs but by maintaining rest of the tissue from which must spring the measures of repair, and by preventing passive congestion, as well as securing cleanliness, that this much vaunted method often proves so serviceable. This, however, is not all. Carbolic acid and similar agents possess the power of preventing and arresting putrefaction, and consequently when applied to a wound the organic material, instead of putrefying after it dies, is preserved in an innoxious state. Friars' balsam acts beneficially, not so much as an antiseptic, nor by sealing the wound, as by effecting continuous repose of the tissue bordering the wound. It will do more good when applied only at the sides of the wound, so as to press them together and keep the tissue motionless. But a more valuable agent is collodion, which we can recommend after many years experience. Collodion is much like fibrin, inasmuch as it contracts as it becomes solidified. When collodion is applied along the course of a superficial wound, care being taken not to coat the wound itself, the immediate result is, as the ether evaporates, a perceptible shrinking of the tissue and an approximation of the surfaces of the wound. The subject, at the same time, feels a sensation of tightness in the part, and for a time, at least, the tissues are retained in a state of perfect rest. The quantity necessary to be used, and the frequency of application, will depend upon the position and the extent of the wound. The pressure must not be too great, else proper arterial supply will be prevented. We have often used collodion for another purpose with great satisfaction, namely, in inflamed breasts and in rapidly growing tumours. The pressure of the hardened collodion prevents the nourishment of the morbid structure.

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II. The application of these principles to the treatment of burns requires some modification. The effect of a flame or burning substances upon tissue is not only to destroy the tissue more or less but to produce an abnormal condition of the nerves which have been exposed. There is a state of hyperæsthesia established which rarely subsides until the wound is entirely closed. This exalted nerve power naturally causes active congestion; at the same time the fibrin poured out is endowed with an extraordinary vitality which prevents a ready development of pus. We are not aware that the antiseptic treatment is urged in the treatment of burns, although we fail to see why air germs should not be in this connection as potent as in ordinary wounds. Bearing in mind the highly sensitive state of the nerve periphery, which is adverse to a regular supply of properly elaborated reparative material, we can at once understand that to control and subdue pain is to remove the essential cause of delayed healing. In this case it is not physical rest which is demanded, but what Mr. Hilton calls physiological rest. The nerves in this abnormal state are particularly sensitive to air with its varying temperature. Therefore, to exclude air is to act upon the first link of the chain. It matters little what agent is employed to accomplish this, so long as it effectually does the work. Flour, starch, in fact non-irritating powder of every kind will answer the purpose, when overlayed with lint or cotton wool. Or if the burned surface be small, an artificial skin may be formed by collodion or balsam. Resinous applications seem to have, at least at a later stage, a soothing effect upon the nerves, apart from protection from the air.

III. The surgeon is called upon not only to treat incised wounds but also those which are complicated with other injury to the tissue divided. Two kinds of injury are met with, contusion and laceration. In these cases we have something more than a solution of continuity; the tissue has been crushed or violently stretched ere the structure divided. The degree of injury varies, not only in different wounds but in the same wounds; it may be so slight as merely to prevent union by adhesion, or it may be so great as to kill the tissue immediately. It is obvious that before healing of the wound can commence, the injured tissue must be restored; and if any of it is to perish, it must be sequestrated before the healing process can proceed. To close up a wound under such circumstances is to incur considerable danger. The work of restoration in the more slightly injured cells or molecules, as well as the sequestra-

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tion of those which have ceased to have vitality, is the work of natural repair; and, in a healthy subject, it will be duly effected without external aid, unless thwarted by external appliances and medication. The organic matter, after perishing and becoming separated from the living tissue, is no longer under the power of physiological forces. This we think is a point of great importance. In wounds of this sort we have two distinct sets of forces engaged, physiological and chemical. As soon as an atom of tissue ceases to have life, it no longer is governed by physiological laws, but it comes under the power of physical laws. The same law which prevails in connection with a lifeless body is in force when a single atom dies—decomposition usually ensues, but this may be prevented or delayed. It may take place slowly, or rapidly. The more rapid it is the more it partakes of the putrefactive character. Putrefactive decomposition is eminently dangerous to the subject; and it is important to understand what favours it and what will possibly prevent it. It requires no demonstration to show that heat and moisture, with stagnant air, constitute the most suitable condition for putrefactive changes. Therefore a wound with disintegrating tissue, closed up, or with only a small opening, furnishes all the conditions favourable to putrefection. On the other hand, an open wound, with circulating air, is adverse to putrefaction. It is submitted that putrefaction is entirely the result of chemical or physical laws as distinguished from vital. It is true that low forms of microscopical life are found abounding in the decomposing debris, but why should we regard these as the agents of decomposition? In the broad domain of nature must we everywhere place visible or invisible organisms as the sole agents of decomposition, and ignore the operations of physical and chemical laws? Suppuration and disintegration, and even putrefaction, we know do often take place beneath unbroken integument, which must be independent of organisms, unless they find entrance through vascular channels, in which case *no external barrier would be useful.* Should we not rather look upon the organisms as the result of the putrefaction? There is a suitable soil for the germs to grow and develop in, just as the putrefying carcass becomes the abode of visible forms of degraded life. Such being the case, it follows that a free outflow of the disintegrating tissue, with the co-existing pus resulting from physiological action, but which has likewise, perhaps, ceased to have vitality, will prevent the putrefaction in the wound altogether. To secure this, ordinary laws must be

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obeyed. The wound must not only be freely open, but its position should be such as would promote the escape of fluid by gravitation. But in some cases this cannot be done, and then it becomes necessary to endeavour to destroy or prevent the putrefaction. If, however, the escape of the organic matter can possibly be effected, it is far preferable. Fortunately we have agents which will prevent and suspend the process of putrefaction, just as we have agents which will preserve edible animal flesh. The butcher who cures his beef or pork does not use the salt to ward off organisms or destroy the germs. He knows that, through its influence, the meat is so changed chemically that decomposition is effectually prevented, and no low forms of life can find a place for growth and development. In like manner, the surgeon may introduce to a wound, or partially emptied abscess, carbolic acid, or some other like agent, which will effect a change in the dead particles of matter, so that they will not putrefy and become the abode of organisms. Hence the value of carbolic acid and its associated antiseptics. At the same time it must not be forgotten that the presence of such chemical agents are more or less detrimental to the healing process—but, of two evils, the less is chosen. If we accept this theory there is little difficulty in determining the proper steps to be taken in the treatment of contused and lacerated wounds in any part of the body, so far as they may differ from those followed in the incised form.

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ON OVARIOTOMY.

BY

E. ROBILLARD, M.D.

My object in presenting this paper is to place before the profession the operations of Ovariotomy and Hysterotomy, as I have lately had an opportunity of seeing them performed with perfect success in Europe on very many occasions by different surgeons of world-renowned reputation, and particularly by the celebrated Dr. Pean of Paris.

In both operations, which are nearly the same, there are five stages:

Opening the abdominal parietes.

Reducing the volume of the tumour.

Breaking down the adhesions.

Bringing the tumour outside of abdomen.

Fixing it, tying the pedicle, and excising the tumour.

Then carefully removing all blood from the peritoneal cavity and closing the parts.

First Stage, Abdominal Section.—This is made exactly in the median line, sufficiently long to allow the tumour to be easily extracted. In certain cases it suffices to begin the incision at the umbilicus, in others it may be necessary to carry the incision one or two inches higher, when it is taken to the left of the umbilicus and continued straight up. Below, the incision should be carried to within an inch or an inch and a half of the pubis.

The primary incision should only be through the skin and cellular tissue. The other parts must be carefully divided, layer by layer, until we reach the peritoneum.

The cutting of the tissues is often accompanied by an insignificant hæmorrhage. Sometimes, as I have seen, owing to the veins of the parts having become varicose from the pressure of the tumour, the effusion of blood is very abundant. Then we have to seize each bleeding point with the hæmostatic pinchers, which are allowed to remain there. Besides this first result of arresting the hæmorrhage these pinchers perform a second, which is, to guide the operator in gently separating the parts. Before continuing the operation it is absolutely necessary to wait for the entire

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and complete cessation of any bleeding—no matter how trifling it may be. After all bleeding has ceased, we may open the peritoneum on a director, or better on the left index finger, previously introduced into the abdomen through an opening made in the lower part of the incision. If blood should flow through this last opening we endeavour to prevent its escape into the peritoneal cavity by careful sponging, and by placing hæmostatic pinchers on the divided vessels with the precaution not to include any part of the peritoneum. We can always obtain this result, as the vessels which bleed are on the outside of the peritoneum, in the cellular tissue which unites it with the other coats of the abdomen, and not in the peritoneum itself.

This part of the operation does not, in general, present any great difficulties. It may happen that the incision made may show adhesions in the region of the umbilicus. These adhesions hide, therefore, the external coat of the tumour, and may considerably embarrass the operator. In this case he must cut directly upon them—not fearing—till the sensation of a hard tissue informs him that he has reached the fibrous substance. The tumour once reached throughout the whole length of the incision, the second stage of the operation commences.

Second Stage, Reducing the size of the tumour.—At this stage the surgeon can perceive either by the sight or by the touch the exact size of the tumour which is before him. He can then judge whether his incision is sufficient to allow the neoplasm to pass out whole. If in doubt he may try slight traction, but must cease so soon as he finds the inutility of his efforts.

In most cases the volume of the tumour is such that all idea of bringing it through the incision has to be abandoned. The incision as it is cannot be itself extended, since it is dangerous to carry it higher than two inches above the umbilicus. In this case, if the tumour consists partly of thin coated cysts, tapping is necessary, as in cases of multilocular cysts. But if the tumour is entirely fibrous, or if it springs from the uterus, a similar proceeding will not obtain the end proposed, and the size will not diminish by tapping. We must then have recourse to the method adopted by Dr. Pean, viz.: slicing or paring it. The following is the manner: We begin by passing through the most accessible part several twists of wire (2nd or 3rd generally), which are tightened with the *serre noeude* so as to interrupt the circulation in the whole part situated above the ligature. We can then excise that

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part with perfect safety, and thus reduce the morbid mass. If the tumour still remains too large, we commence again in the same manner lower down, cutting more off till we think we have reduced it sufficiently. On this I wish to offer a few remarks: Whether we wish to empty the cysts with the ovariotomy trocar, or whether we wish to excise the tissue with the bistoury, we must be very careful not to allow the escape of any liquid into the peritoneal cavity—the success of the operation depends upon this; therefore, if it consists of one or more cysts, draw the sac out by means of the large pinchers of Nelaton or Pean. If it consists of a geodiform tumour, the excision of which would cause hæmorrhage or effusion of serum, place around the tumour sponges and cloths sufficient to absorb either from the surface of the section. Lastly, if there are any bleeding points on the periphery of the morbid mass sufficiently large, they must be ligatured in two places, and cut in the centre.

Third Stage, Rupture of all adhesions and extraction of the tumour—To assure ourselves that adhesions exist we can insert the hand into the abdominal cavity and examine the base of the tumour and its coats to ascertain whether any are present, or introduce a sound between the surface of the tumour and the abdominal walls. This will suffice to show whether there are any adhesions or not, and gentle traction of the tumour points out where it is retained by them. This is certainly the most difficult part of this step in the operation. Great patience and much care is requisite, and we must not become discouraged nor be in a hurry, for it is in breaking down the adhesions that we are liable to have blood poured out into the peritoneal cavity. Therefore we should take every possible precaution to prevent this. We may commence the rupturing of the adhesions at any part, so that we gradually reach the deepest. If they prove to be vascular, we must carefully tie all the vessels we possibly can, both ends of the ligature being cut as close as may be, and allowed to remain in the peritoneal cavity. The number of these need not cause any alarm, as I have seen thirty to forty used in one operation. If there should be a general oozing of blood we apply the actual cautery, particularly to the parietal adhesions or the omentum, being careful not to touch the intestines. To isolate the parts to which we wish to apply the cautery we have to use the clamp with towels and sponges. If any considerable portion of the omentum is adherent to the tumour and very vascular, it will be

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better to ligature the whole and cut off the part rather than to detach it. If the piece thus cut off is very large, or continues to bleed, it will be preferable to draw the whole to the outside and apply sutures. To detach the adhesions we use a spatula made expressly for that purpose, or dissecting forceps with blunt edges. We must, as much as possible, avoid using the knife. We can use our fingers, but if the adhesions cannot be removed in consequence of their great vascularity or their friability, they must be drawn outside in a mass and kept there. In the course of a few days, suppuration is established in the part thus drawn out, and the discharge cannot fall into the cavity of the abdomen. During this period of the operation the assistants at each side of the patient must carefully sponge the bleeding surface, apply the necessary ligatures, assist in applying the clamps, and keep the lips of the wound open, which they will do with their hands covered with cloths heated to the temperature of the body, or with a retractor. If the morbid mass is now free and detached at all points, and if its size is sufficiently reduced to pass through the opening, it will be easily brought out. But to make the necessary amount of traction it is requisite to have some point of support. This will be afforded by the large forceps of Nelaton or Pean, or by very strong metallic wire passed through the tumour, if it is entirely solid. The extraction of the tumour must be done with care and gentleness. It is absolutely requisite that an assistant should watch the extraction of the mass to prevent any hernia of the intestines, and when, as sometimes happens, it comes out too quickly, the assistant must rapidly close the incision. At last, when the tumour is completely out, the operator must firmly support it, so as to prevent any further motion, for if he does not he may cause lacerations capable of producing alarming hæmorrhage from the neck of the uterus, should it emanate therefrom, or from the pedicle if a peri-uterine tumour.

The fourth stage consists in keeping the tumour quite steady and ligaturing the pedicle, and then cutting off and removing the tumour. The various relations the morbid mass may have had with the uterus compels us to make distinctions: if the tumour is adherent to the uterus by a fine pedicle there is nothing more simple—pass transversely through it, as in a case of cysts, two needles, and underneath a double metallic wire which we tighten with a *serre noeude;* but if the pedicle be thick and deeply implanted on the uterus, for example a fibro-cystic tumour

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attached to the upper part of the uterus, evidently the complete extirpation cannot be done without interfering with the uterine tissue, which is more or less diseased. In this case the most rational course is to amputate without hesitation, for the neck of the uterus being thin has but little vascularity, and this method saves us from a great number of complications which we should encounter in trying to save a part of the organ. While our assistant is holding the uterus and the tumour in a position perpendicular with the abdomen the operator will ascertain the relative position of the bladder and the neck of the uterus by the sound or catheter, and also the different connections with the rectum. Once certain that he will neither wound the bladder nor the rectum, he will cross the neck of the uterus with a stiff straight wire from bottom to top, from right to left, and another from the other side in the same manner. These wires have a double advantage, they not only serve to fix the neck of the uterus but also to direct the place in which we are to insert the needle to which the ligature is attached. This is done as follows: we begin by crossing the neck from front to back with a curved needle, having a handle so as to bring it out at the opposite side, above the long wire previously introduced; this done, we put a strand of wire in the point of the curved needle (which has a point like a crochet needle) and then we withdraw it, by which we have two ligatures each strangling one half of the neck. These ligatures can be admirably made with Dr. Cintrat's *ligateur serre noeude.* If it be found to be very vascular it will be advisable, as a matter of safety, to put a third ligature, taking in the whole of the neck. All hæmorrhage having been thus prevented, we can fearlessly excise the body of the uterus and the tumour in its entirety. It is necessary that at this moment an assistant should bring the incised parts as close as possible. Should the ligatures give at all we see it by the bleeding which then takes place. We must have recourse to the *serre noeudes* which were left in position. As I have described this operation it necessitates the removal of the ovaries and Fallopian tubes. If the neck be the seat of the neoplasm the total excision of the uterus is absolutely necessary. We must always allow the *serre noeudes* to remain, placed at the lower extremity of the abdominal incision. If considered necessary the pedicle may be cauterised, protecting the surrounding parts by the clamp.

Fifth stage, dressing of the peritoneum.—Suture of the wound

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Before beginning this part of the operation we must carefully clean the whole of the peritoneum, for the success of the operation mainly depends upon the care with which we remove all effusion or blood, which, in spite of all our precautions, will find its way into the cavity. All this must be carefully absorbed by small sponges, which can easily be applied with Pean's forceps. If the amount of fluid is large we may use heated towels for this purpose. When we find that all effusion has been absorbed by the above method we proceed to suture the abdominal incision, but, before doing this, we insert between the lips of the incision a napkin, heated to the temperature of the body, which is kept as smooth as possible over the intestines, so as not to allow any air to come in contact with them, removing it as we descend with the sutures—the sutures naturally being commenced at the top of the incision and carried down to the pubis, one suture being deep, the next superficial, and so on. The deep ones which include the peritoneum must be made with very fine silver wire on an ordinary curved needle. The alternate sutures are ordinary twisted ones, being only through the skin; for this last purpose we have to use very fine needles, and, as the thickness of the skin is often very great, we generally use the *chasse epingle* of Dr. Cintrat. Before closing the lower part of the wound it is necessary to apply the small sponges again so as to absorb any effusion that may have occurred, and directly before and behind the pedicle we use larger pins with heads, for the purpose of having a more equal junction of the tissues and thus to prevent any stretching of the parts. This last part of the operation being finished, we replace the patient in bed, on her back, with the thighs upwards and the legs back, supported by cushions placed under the knee. The abdomen must be covered with wadding and the patient thoroughly warmed by every gentle means possible. This is a description of this important operation in its simplest manner.

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VESICO-VAGINAL FISTULA.

BY

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This disease has long been the opprobrium of our profession, and although marked advances have been made in its treatment yet it still is of great interest to the gynæcological surgeon. Perhaps no other affection to which women are liable equals the distress and suffering caused by its presence. In this, as well as in other things, the woman of our day owes a debt of gratitude and praise to those able men who have so successfully devoted their great abilities for her relief and restoration to health. This sense of appreciation is all the more enhanced by the fact, that the treatment of fistula is one that yields little or no pecuniary reward. Hundreds of cases have been cured by the ablest operators of the day without a single fee. Any one willing and able to deal with these cases is generously supplied with patients by his brethren. This arises from the fact that at the present time nearly every case occurs among the poor, especially those living in sparsely settled parts of the country. On the other hand, among the more wealthy classes, who are able to secure competent obstetrical skill, such an occurrence as vesico-vaginal fistula is almost unknown.

When we glance at the history of this disease, we cannot but be amazed that century after century passed away without awakening more interest in, and effort for, the relief and cure of this sad calamity. There can be little doubt that it was well known to the ancients and of vastly more frequent occurrence than now. They were ignorant of the resources of the present accoucheur for effecting delivery in difficult cases with safety to the mother as well as the child, and they had no definite appreciation of what nature could or could not be expected to accomplish. To our superiority in all these respects is due the rare occurrence of fistula in civilized lands.

The first well-directed attempt at the treatment of vesico-vaginal fistula, was made by Ambrose Paré in 1570, over 300 years ago. From that time down to 1852 many and varied attempts were made to cure this disease. Among those who deserve more than passing mention, Gosset, of London, may be named on account of his

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genius and success. He in 1834 actually forestalled the illustrious Sims in all the essential features of the treatment of fistula. Had his brilliant results been accepted by the profession of his day and acted upon, thousands and tens of thousands of lives would have been saved from a living death of unutterable agony that swept its victims to an early grave. Gosset failed to implant his views upon others, and it was reserved for Sims, who, with the consciousness of knowledge and the enthusiasm and energy of a giant, impressed his well-digested views and results upon the profession. It is true the objects sought to be reached had been worked out by others, but Sims not only worked out the principles which led to success but perfected the details of the operation and believed in his work. Other well-known and able workers have appeared on the field, conspicuously among whom stands the honoured name of Simon, all too soon removed by death from a career of honour and usefulness, also Emmet and Bozeman of New York. The latter is chiefly known for his zealous efforts in propagating his views with regard to the preparatory treatment of fistula by gradual dilatation. This method, while exposed to serious objections, is now admitted to be useful in those cases where the margins of the wound are fixed, and the aperture difficult of access.

The varieties of vesical fistula are many, as the following list will show:

1. Vesico-vaginal fistula.
2. Urethro-vaginal.
3. Vesico-urethro-vaginal.
4. Vesico-uterine.
5. Vesico-utero-vaginal.
6. Uretro-uterine.
7. Uretro-vaginal (the bladder and urethra not being affected).
8. Vesico-rectal.

Without dwelling upon these varieties it may be proper to allude to the causation of the different forms and positions of vesico-vaginal fistula itself.

There can be little doubt, when there is no calculus in the bladder, that the destruction of the tissue removed is due to pressure between the pelvic bones and the child's head. The position and extent of mischief effected necessarily varies with the position of the uterus and bladder. In some cases the anterior lips or lower segment of the uterus is thus caught and injured.

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The extent to which this descent occurs gives us high or low vesico-vaginal fistula, or the uretro-vaginal form, which is the most difficult to treat. Here, by the way, although not strictly germane to the thesis, it may not be amiss to urge upon accoucheurs the fact that the anterior lip of the uterus is not unfrequently caught between the head and pubis, thereby causing not only greatly increased suffering to the patient, but also preventing descent of the head and causing laceration of the tissues, especially if the forceps are employed, without rectifying the difficulty. In some cases a full bladder causes sufficient prolapsus to be thus grasped and injured. I need hardly say that vices of pelvic conformation will be sufficient to cause, or favour, the occurrence of fistula also. The points now spoken of are worthy of being more fully dwelt upon, but the limits of the paper may possibly be more than made up by their discussion. Other causes for the production of fistula exist, such as malignant disease, injuries the result of accident, or attempts at abortion, but these are foreign to the subject and will not be dwelt upon. However caused, the presence of a vesico-vaginal fistula is one of the most deplorable accidents to which suffering woman is liable. Happily, at the present day, this fearful disease is of rare occurrence, and is generally within the range of certain surgical cure. The question now deals, not so much with the success of the operation, as with the mode of treatment which offers comparatively the greater facilities to the operator and after-comfort to the patient. Embarrassed as we are with the rich experience and teaching of many eminent men, it is no easy task to settle this question even for one's self, much less for the general acceptance of the profession.

No one conversant with the literature of the subject will have failed to perceive that men of genius have also their prejudices, like other mortals of lesser note. While all are agreed as to the objects to be accomplished, each follows his own path toward success.

In considering the operation for fistula, it may be conveniently divided into *three stages*. 1st. Access to the parts. 2nd. Mode of operating; and 3rd. The after-treatment. Access to the fistula is secured by the position of the patient, and instruments for giving access to and for flooding the properly placed parts with light. The *dorsal* and the *abdominal* postures are the chief ones resorted to. The exaggerated lithotomy position, so highly esteemed by the renowned Simon, is now most generally regarded as offering the great-

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est advantage to the operator. This posture not only gives a clear view, but helps to depress the parts, and allows of the least possible hindrance from hæmorrhage while paring the edges of the wound.

With regard to the instrumental means resorted to for gaining access to the fistula, we must not overlook the value, in some cases at least, of Bozeman's mode of gradual dilatation. This plan commends itself in those cases where the contraction is extreme and there is a large amount of dense cicatricial tissue. Where possible, with the exercise of slight incisions and little violence, the immediate method, so strongly commended by Simon, is to be preferred. Such a procedure lessens the dread of preparatory treatment on the part of the patient, and the oftentimes troublesome delay on the part of the operator, and is also less apt to be followed by pelvic cellulitis. The conjecture that the rapid union of such divisions is apt to interfere with the union of the fistula is not tenable, inasmuch as the edges of the fistular wound will unite as quickly as coapted fresh surfaces elsewhere.

Having prepared the parts for exposing the fistula, we must then turn to that most invaluable instrument, *Sim's speculum*, and in it we find the best and only means for the purpose of illuminating and at the same time of operating with satisfaction in these cases. Where possible, displacement of the uterus, by traction downward, will often greatly facilitate the operation by bringing the fistula to the edges of the vulva.

2. What form of operation shall be selected. Upon this important point there exists a considerable diversity of opinion among writers. The position of the fistula and the character of its margins should determine the extent of tissue to be removed. More risk follows extensive removal of the edges of a urethro-vaginal than of a vesico-vaginal fistula. In the latter case incontinence may follow, even if the fistula closes; while in those cases where the first operation fails, the chances of success by a subsequent operation are greatly diminished.

In all cases it is well to remove nothing more than is necessary to reach sound tissue. In order to obtain healthy vascular margins, the mucous membrane may be incised and vivified by the application of silver nitrate. Conservation of tissue is so important that it has been strongly advised to pare away the margins little by little, lest even a small amount of sound tissue be unnecessarily removed.

The best form of incision is, by general consent, that which

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leaves the freshened surface a bevelled one at the expense of the mucous membrane of the vagina. There is nothing to be gained by removing any of the mucous membrane lining the bladder. The chief reason for avoiding the vesical surface, apart from its uselessness, is the danger of wounding the ureter, especially where large apertures exist. The advantage of the bevelled surface is that a larger fresh surface is brought into apposition, thereby increasing the probabilities of successful union.

Without occupying time with reference to the instrument best suited to the operation, it may not be out of place to insist upon the superiority of the knife over the scissors for freshening the edges of the fistula. There is an old proverb, "that a bad workman quarrels with his tools." While acknowledging this, it must be conceded by all that proper and convenient instruments greatly contribute toward a favourable result. In this connection I am happy to exhibit a set of vesico-vaginal instruments recently acquired. As to the suture used, I am of opinion that the common interrupted suture is as good as any other. It permits of a perfect view of the state of apposition, is easy of application, and the results by it are as satisfactory as with the button suture or the use of shot perforated and clamped upon the wire.

We now come to the third division of the subject, viz., the after-treatment. It will be conceded by all, I think, that there is but little, if any, possibility of greater perfection being attained in the two stages of the operation now referred to. Perfect exposition and access to the parts, perfect co-aptation of properly prepared surfaces should render the operation an almost unvaried success, provided always that the after-treatment is as perfect as the prior stages of the operation. To prevent the stitches from cutting through tissues and to secure union, the urine must be removed at frequent intervals, if not as rapidly as secreted. So far, no writer has proposed other means for the removal of the urine than the catheter. Most authors advise the constant retention of the catheter, while a few, notable among whom is Simon, advise a better course, the removal of the urine at short intervals. It will be obvious to all observers, that both of these plans of treatment are imperfect, and fail to meet all the indications desired. The retention of the catheter necessitates the constant recumbent posture, and is a well-known cause of cystic derangement. On the other hand, the occasional resort to the catheter necessarily occasions some stress upon the sutures, and at

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the same time is apt to interfere with perfect union by moving the parts. The most perfect surgical work is thus imperilled, and, to obviate this danger is the great desideratum of the operation. It is my object to meet, if happily I may, this felt want in the treatment of vesico-vaginal fistula. What is sought is a safe and reliable method of dealing with the urine, so as to prevent its accumulating in the bladder, especially during the first few days after the operation, and that, too, without the use of the catheter. The attainment of these two important requisites can be perfectly secured by means of the rapid or gradual dilatation of the urethra previous to operating. I need hardly say that I lay no claim to priority as regards dilatation of the urethra for purposes of diagnosis. To Noegerath of New York belongs the honour of first bringing this important aid to diagnosis before the profession, although it was first resorted to by the illustrious Simon.

The value of urethral dilatation as an aid to diagnosis in certain cases can hardly be over-estimated, but, so far as I am aware, up to the present time, its great value, as a means of treatment, has not been urged by any writer.

The advantages claimed for this procedure are: 1. That it entirely does away with the retention of the catheter. 2. That it allows the patient considerable freedom of movement without endangering union. 3. That it obviates the occasional introduction of the catheter with its accompanying dangers. 4. That it permits of the perfect escape of the urine during the first few days after the operation, thereby avoiding all stress from accumulation, as well as danger of cystitis if the catheter is retained. 5. That the gradual return of the compressor and sphincter urethral muscular power affords the best possible means for the gradual enlargement of the disused bladder—the returning powers of the urethra being admirably suited in the inverse ratio to the gradual distention of the organ. As to the mode of dilatation, I prefer the rapid immediate plan, where the parts are easily distended. The presence of cicatricial tissue would lead to the selection of the more gradual method by sea tangle. This latter method, however, has the objection of being painful, and at the same time somewhat intimidating to the patient. The extent of time to which we wish to remove the sphincter action of the urethral muscles will determine the extent to which we dilate the passage. The greater the dilatation, the slower the return of continence. Dilatation to the extent of admission of the

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index finger, usually causes incontinence for twelve or thirteen days.

There may be many points left quite untouched, but I deem it best not to longer occupy your time. I would urge the value of the treatment now commended. It supplies what was lacking for the perfect treatment of this dreadful affection. It gives a success to the after-treatment as great as that which has been attained by the illustrious Sims and Simon in the first stages of the operation.

On a future occasion I hope to have the pleasure of offering you the statistics of cases operated upon, which up to the present time are too few to be of much interest to the profession.

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EMBOLISM OF THE ARTERIA CENTRALIS RETINA.

BY

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The first case of supposed embolism of the retinal artery was described in the year 1859, by Von. Græfe,[1] of Berlin; since this time a large number of similar observations have been made by many observers, most of whom seem to have accepted without question V. Græfe's explanation of the peculiar and striking phenomena presented by this class of cases; some few, very capable ophthalmologists, however, have endeavored to prove that the signs and symptoms commonly attributed to embolism of this artery are due to another cause, viz., an inflammatory affection of the orbital portion of the optic nerve with consequent obstruction or thrombosis of the arteria centralis by pressure from without. Embolism of the ophthalmic artery or of one or more of its larger branches has also been suggested as a possible cause of the sudden loss of sight and the remarkable ophthalmoscopic changes which have taken place in the fundus oculi in the cases recorded as embolism of the arteria centralis. All of these hypotheses have one thing in common, that is, the more or less sudden and complete arrest of arterial circulation in the retina. However this may be brought about it is not unreasonable to suppose that the primary changes thereby induced in the eye itself will be essentially of the same character, hence the ophthalmoscope will at first be of little or no assistance in making a differential diagnosis between the possible causes of the obstruction in the retinal circulation and consequent impairment, or loss of vision. The subsequent course of events may, however, suffice to clear up the difficulty, for it is highly improbable that the blindness resulting from circumstances so widely different as the mere plugging of one small arterial twig, and the other two conditions mentioned, would in all respects run an exactly similar course. For a definite solution of the question, we must, in addition to clinical observation, have recourse to physiological experiment and pathological investigation. It is, perhaps, needless to say that, in the human being at least, the last two means

1 V. Græfe, Arch., v. I. s. 136,—157.

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of obtaining further knowledge concerning this affection of the eye are, for obvious reasons, but rarely within our reach. With a view to placing on record some facts accidentally obtained by an operation undertaken for the removal of an orbital tumour, and which had somewhat the character of a physiological experiment bearing upon this interesting subject, I have ventured to offer a few remarks concerning embolism of the retinal artery; but I will first give, by way of illustration, a short account of a case which is, perhaps, a fair example of the affection of the eye commonly ascribed to this condition.

Case 1.—M. L., æt. 32, a healthy-looking, well-developed French Canadian woman, came as an out-patient to the Montreal General Hospital on Tuesday morning, May 15th. When she awoke on the morning of the preceding Sunday, after a good night's rest, she experienced a peculiar sensation of discomfort in the right eye, and soon discovered that the sight was gone. Several transient attacks of blindness of the same eye had occurred quite recently, one of which, a few days before, had lasted about half an hour, but had passed away completely. Two years ago she was confined to the house for three or four months with a severe attack of articular rheumatism; two similar but less severe attacks had occurred some years before. She is married, but has never been pregnant. Suspecting embolism, I examined the heart, and found evidences of enlargement of the left ventricle with valvular disease. Prof. Howard, who kindly made a more thorough examination some hours later, discovered both mitral and aortic valvular lesions.

Vision appeared to be totally abolished, the strongest focal illumination did not give rise to the faintest perception of light; the pupil was moderately dilated, and immovable, but re-acted fairly well when the other, healthy eye, was exposed to the same stimulus. Other external appearances of the eye normal, as were also the tension and movements of the eyeball.

Examined with the ophthalmoscope the refractive media were unimpaired and the refraction was emmetropic, but there were certain very definite changes in the appearance of the optic nerve and retina. Pallor of the optic papilla was a well-marked feature; its margins were somewhat indistinct, owing to a distinct cloudiness of the retina at this part; this cloudiness increased in intensity towards the macula lutea, where it assumed a uniform, almost milky whiteness, excepting a small, circular, dark cherry red spot at and,

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immediately around the fovea centralis. Compared with those of the other eye both arteries and veins in the vicinity of the papilla were very considerably diminished in calibre, and, although all the main vessels contained blood, and were plainly distinguishable from each other, as arteries and veins, by the usual colour contrast, the former appeared to be relatively too small. On the papilla the veins, of which there were three of large size, tapered off so that their pointed extremities disappeared in the face of the nerve. Pressure on the eyeball did not elicit pulsation either in the veins or arteries. Towards the equator the veins were fully equal to, if not larger, than those correspondingly situated in the other eye, whilst the arteries still remained too small at this part. Several small vessels running towards the macula were somewhat tortuous, and, owing to their superficial position in the whitened retina, very distinct. The two main arterial trunks running upwards and downwards, each divided as usual near their respective margins of the papilla into two other external and internal, or nasal and temporal branches. Just after the division had taken place the lower temporal branch seemed to dip deeply into the retina and for a short distance was almost lost from view. Immediately beyond the point of division of the upper main trunk I noticed a small hæmorrhage which increased to four times its original size whilst under observation by the direct method, and I could see the extravasation slowly growing till it had attained an apparent length of about $\frac{1}{4}$ of an inch and a width one-third as great; it was of a bright red colour, and evidently situated in the nerve fibre layer.

May 17th. Status idem.

May 20th. There is a small blood-stain on the surface of the papilla, but no other notable alteration in the ophthalmoscopic appearances.

June 2nd. The whiteness of the retina has almost completely disappeared, and there is not a trace of the two blood spots already mentioned to be seen, but there are two small red spots, probably hæmorrhages, between the papilla and macula lutea. At the latter are a few white specks in the retina, and some disturbance of pigment in the epithelial layer. The optic nerve is very white, and its margin somewhat veiled; the veins are of about normal calibre, but only one of the three large trunks is considerably narrowed where it dips into the nerve. Just at the proximal side of the point of division of the lower arterial trunk there is a well-marked fusi-

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form dilatation of the artery,—a similar still larger dilatation exists at the commencement of the upper temporal branch. The arteries on the disc pulsate faintly when pressure is made on the sclerotic. The blindness is no longer complete, as the patient can now count fingers excentrically at one foot distance, and the papilla is perhaps a little less blanched.

June 16.—Arterial pulsation is easily produced by pressure, though the vessels have not increased perceptibly in size. The fusiform dilatations are smaller than when first observed, only a slight cloudiness of the retina near the optic nerve is noticeable, and narrow white lines extend for a short distance along the sides of some of the arteries, which present the striking peculiarity of being larger towards the equator than they are in the vicinity of the papilla; they are, moreover, not uniform in size, but appear thicker in some parts than in others, one medium-sized artery running upwards and inwards has the appearance of being constricted, as if tied with a ligature; this peculiarity is situated, at some little distance beyond the margin of the disc. Vision has so far improved that fingers are counted at about four feet distance.

September 4.—There have been no material changes in the condition of the eye during the last six weeks. The fusiform dilatations of the arteries at the papilla have almost disappeared, but are still visible in the upright image. Towards the equator the arteries have the same characteristics as in June 16th. The veins have not presented any further noticeable alteration since June 2nd. Vision is limited to a very small area, and remains eccentric. Were it not for the peculiarities mentioned in the arteries, and the somewhat nacreous whiteness of the papilla, together with the absence of those markings which are commonly attributed to the lamina cribrosa, the case might be mistaken for one of simple atrophy of the optic nerve.

This I think may be regarded as a fair type of that, fortunately, rather rare affection of the optic nerve and retina, which many ophthalmic surgeons believe to result from embolism of the central artery.

If the case is admitted to be one of embolism it is probable, 1st, that the obstruction was situated somewhere between the origin of the retinal artery and its first bifurcation, because both divisions of the artery within the eye participated to an equal degree in the subsequent changes, and there is not the slightest evidence indicative of obstruction of circulation in any larger-sized vessel within the orbit:

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2nd, that the obstruction was at no time complete, or, if complete, that a certain amount of collateral circulation was very soon established.

There is no reason to suppose that the arteries were not carrying blood when the case was first observed, two days after the attack of blindness which has run the course described. The mere fact that arterial pulsation could not be produced by pressure until some days later does not prove total obstruction during the time which elapsed between the outset of the disease and the date on which this one unmistakable evidence of circulation was noted; for it is obvious that pulsation can only occur when the arterial current possesses a certain degree of force, that is to say, a force sufficient to overcome at each systolic impulse the pressure exerted on the blood columns through the coats of the arteries. With a feeble current, such as would result from nearly complete obstruction, it is quite conceivable that an increased resistance, however effected, might cause total arrest of the circulation, and, as a consequence, absence of the phenomenon of arterial pulsation. Perhaps this is what Mauthner means when he states in his text-book on ophthalmoscopy (page 345) that "If H. Knapp by pressing on an eyeball affected with embolism could perceive no change in either arteries or veins, it is impossible to draw any conclusion from this unintelligible fact."

The increase in size of the arteries towards the periphery cannot be explained by assuming that they have received a collateral supply of blood from the ciliary arteries, since the very meagre communications known to exist between these two sets of vessels are only found in the immediate neighbourhood of the papilla. (Leber). Whatever the true explanation may be, it will probably also account for the fusiform dilatations which only made their appearance after the retinal circulation was sufficiently restored to permit of arterial pulsation. Possibly the normal innervation of the arteries may have suffered, in the general disturbance of the retina, in such a way that certain portions of these vessels underwent a more or less permanent loss of tonicity: this assumption is not inconsistent with the ultimate diminution in the size of the two well-marked dilatations on the larger branches.

Leber in some remarks on a case described by Knapp,[1] seems to infer that the position of the embolus in a branch of the retinal

[1] Gesammten Augenhëilkunde, B. V., Zweiter Hälfte, s. 554.

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artery was indicated by a spindle-shaped dilatation near the border of the disc. The existence of several enlargements of this kind in the same artery could not, I think, be explained in this way. The few small hæmorrhages observed were only remarkable from the intervals which elapsed between their occurrence. They were probably caused in some way by the return of arterial circulation, rather than by reflux venous hyperæmia such as takes place after embolism in other parts of the body.

Case II presented ophthalmoscopically a somewhat similar set of symptoms, but these were artificially produced by means of electricity. The patient was a healthy, robust young French Canadian country girl, fifteen years of age, whom I treated in the Montreal General Hospital for a supposed venous tumour of the orbit, which I propose to describe more fully at some future time. The tumour was soft and elastic, and extended far back into the orbit. A partial cure has been effected by the use of the galvanic current. Some improvement took place after two or three applications derived from six cells of a Kidder battery, a long needle, insulated to within half an inch of the point, being passed an inch and a quarter directly backwards into the orbit through the most prominent part of the growth. With this needle the negative pole of the battery was connected. The positive pole was applied to the corresponding angle of the lower jaw. The electric current was allowed to flow for twelve minutes. Some swelling of the upper lid ensued, and a small quantity of gas escaped around the needle. In other respects no visible effect was produced either upon the eye itself or its adnexa. Some days later it was determined to try the effect of introducing two needles as far as the apex of the orbit, one through the upper, the other through the lower lid. The upper needle was connected with the cathode, the lower with the anode. Six elements were employed as before, and the appli cation continued about eighteen minutes. The patient complained a good deal of pain during the whole of this time. After about two minutes had elapsed I noticed that the pupil was rather widely dilated and did not respond to light. When the operation was completed the lids were a good deal swollen, but did not crepitate on pressure; I therefore inferred that the swelling was due to an effusion of fluid, rather than to an accumulation of gas in the tissues. The pain complained of was referred to the brow and temple. When the needles were withdrawn the patient said the sight of this eye (which had previously been perfect) had become

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dim, but she had no difficulty in counting fingers at ten feet distance. The eyeball was somewhat injected and the tension notably increased.

Twenty minutes later I made an ophthalmoscopic examination by the direct method, and found the refractive media perfectly clear, the optic papilla pale, its margins indistinct owing to cloudiness of the retina at this part, and both sets of vessels uniformly diminished to about one half their normal calibre.

Ten hours after the operation I made another examination and found the same condition of things, except that the cloudiness of the retina was still more marked around the papilla. This cloudiness became of a dense greyish-white towards the macula lutea, which had the appearance of a dark red, oval spot about one third as large as the papilla. From this point the whiteness of the retina faded in every direction, and was no longer visible at any part situated half way between the yellow spot and the equator. The retinal blood vessels, as before, were everywhere uniformly diminished in size; some of the larger ones near the papilla were partially hidden by the opacity of the retina, but, as in the case of embolism, some of the small twigs which run towards the macula were unusually distinct. There were no retinal hemorrhages. The tension of the eyeball was unmistakably increased, but the arteries did not pulsate even when pressure was applied. The papilla was of a dull white colour, but not much, if at all, swollen. The patient still complained of great pain in the brow and temple, and the proptosis was greater than before the first operation. The lids very much swollen, reddened, and somewhat tense; they could not be opened by a voluntary effort. All the movements of the eyeball were very imperfect, and the external rectus seemed quite powerless. Vision = 0. Cold compresses were ordered to be kept constantly applied.

On the following morning the patient was free from pain, there was less swelling, and the tension of the eyeball was normal; but there was no material change in the ophthalmoscopic appearances.

Seventy-two hours after the operation the whiteness of the retina had decidedly diminished, though the macula lutea still retained the peculiar appearances already mentioned. Vision = $\frac{6}{200}$.

At the end of two weeks the upper lid could be raised sufficiently by a voluntary effort to expose the lower half of the cornea, and the movements of the eyeball were less restricted.

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The retina had almost recovered its transparency, and the macula lutea presented a mottled appearance, which was due to a cluster of yellowish-white dots at this part. These dots had a somewhat stellate arrangement. The retinal vessels, especially the arteries, were still very small as compared with those of the other eye. Arterial pulsation was easily observed when slight pressure was made upon the eyeball.

At the end of four weeks all the ocular muscles had regained their normal strength with the exception of the external rectus, which still remained almost completely paralyzed. The retinal vessels presented no further change. Optic nerve very white, and surrounded by a narrow ring of choroidal atrophy. The stellate figures at macula not quite so conspicuous as formerly. Vision had improved to $\frac{12}{200}$.

Some weeks later electricity was again applied several times by means of one needle, once with the effect of producing a severe attack of inflammation in the orbital tissues, but without creating any further disturbance in the interior of the eye. From this time the tumour rapidly shrank until very little deformity remained. The external rectus also regained its full power. The pupil continued dilated throughout, but contracted to a pin-hole aperture soon after a drop of calabar extract was put into the conjunctival sac. This contraction was, however, only temporary. Vision did not improve beyond $\frac{14}{200}$, but there was no contraction of the visual field, and all colours could be distinguished seemingly as well as with the healthy eye despite the atrophic appearance of the papilla. From these facts I infer that this permanent impairment of vision was mainly due to the pathological condition of the yellow spot and its immediate surroundings, and in this respect the case differs very much from those of so-called embolism, for in the latter great contraction of the visual field is always, or nearly always, found to exist whenever fairly good central vision is retained.

At least two causes suggest themselves to me as having to do with the changes which in this case took place in the retina and optic nerve. The first is the possibility of some chemical or disintegrative change having taken place in these structures from the direct action of the electricity. Supposing this to be the case, it is not easy to understand why the textural alterations in the retina should be most intense at or in the neighbourhood of the yellow spot. Indeed, we may fairly assume that the greatest

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amount of visible disturbance would have been manifested at the part situated nearest to the needles, viz., somewhere to the nasal side of the entrance of the optic nerve, but this certainly did not occur; moreover, if the optic nerve had been seriously damaged, we might anticipate some defect in the peripheral portion of the field of vision, but we have seen that central vision suffered if not exclusively, at least to a much greater degree than did the peripheral.

The second and more probable explanation, at least of the changes which took place in the retina, is that they were caused by an obstruction to the circulation in the retinal artery. This might have resulted (*a*) from spasm of the artery due to excessive stimulation of its muscular coat; (*b*) from coagulation of blood in the artery; (*c*) from swelling of the nerve or its sheath and consequent pressure upon the artery. The latter seems the most probable solution of the question, inasmuch as swelling of some of the orbital tissues did occur in a very marked degree, and constituted one of the first and most conspicuous effects of the action of the galvanic current. If this assumption can be sustained, the case was, in point of fact, equivalent to the so-called retro-bulbar neuritis, but as yet it would be premature to do more than offer the suggestion. I hope, however, to be able to speak more decidedly upon this point at some future time, since I have found that similiar ophthalmoscopic changes may be produced in the optic nerve and retina of rabbits when two needles are passed to the back of the orbit in the direction of the optic nerve, and a galvanic current derived from six or eight cells is allowed to flow for a few minutes whilst they are in this position.

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ON THE ORIGIN AND DEVELOPMENT OF THE EPITHELIAL TUMOURS OF THE ANTERIOR THIRD OF THE EYE-BALL, WITH SOME GENERAL REMARKS.

BY

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The tissues of the eye which are the seat of epithelial tumours allow of a very minute examination with the microscope, perhaps more so than any other tissue. This reason has caused physiologists and histologists to make the cornea their favourite object for studying; therefore, I do not hesitate to bring before this association a subject which may at first appear as-if it were meant more for a society of oculists only. Epithelial tumours, however, come under the observation of any medical practitioner, and, whether the knowledge we gain is derived from a special organ or not, its general value is the same.

I. Clinical Appearance.—Epithelial tumours form only a very small percentage of the diseases of the eye-ball, about 0.3 per cent. Their seat is either the bulbar conjunctiva or the corneo-scleral margin. Their appearance in the beginning is that of a phlyctænula, later on they sometimes assume the shape of pterygium, but more commonly the papillary form known as cauliflower-cancer.

In the beginning they are so much like phlyctænulæ that even the great clinicist Von. Graefe described two cases, which he had treated for a very long time as such, before he was convinced that he had to deal with epithelioma.

If the tumour is so perfectly localized that all symptoms of a general inflammation are wanting, and if the patient is more than fifty years old, we probably have to deal with an epithelioma. The age of the patient, however, does not always warrant the diagnosis, since phlyctænulæ are seen in old people, and on the other hand epithelioma *may* happen in young persons, as I myself had occasion to examine such a growth, which was removed from a youth sixteen years of age. In many cases

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the patients complain of shooting pain, this is, however, an unreliable symptom as to the diagnosis, since it is not invariable.

We see, therefore, that the symptomatology of the disease in the eye does not always give us a hint as to the right diagnosis, and in many cases we shall have to recur to the microscope as the only means of security.

The tumour may for a long time keep its original place on the bulbar conjunctiva or the corneo-scleral margin without spreading. From some cause or other, however, it eventually begins to spread, mostly towards and into the cornea. If the eye be not removed in time the tumour may involve the whole area of this membrane and spread even further.

The only treatment for the disease is, of course, its removal, and experience has shown that at an early stage it is possible to remove the tumour with preservation of the eye-ball, and to obtain a perfect cure. If the evil has spread over some part of the cornea or sclerotic the eye must be extirpated even if some vision is as yet retained. If the disease has reached the deeper parts, it may be necessary to empty the orbit entirely; such cases, however, are mostly lost through relapses and metastasis.

I have had occasion to examine just a dozen epithelial tumours of the anterior third of the eye-ball, making nearly as large a number as have hitherto been described in literature by Von Graefe, Althof, Berthold, Classen, Knapp and others. These authors advance different theories as to the origin and growth of the tumour, I shall, therefore, in the following remarks, give simply the results of my own researches. Since the eyes from which the specimens were taken have been sent to me for examination only, I have no right to describe the cases severally, and am thus forced to give mainly a general synopsis.

II. *Histological Appearance.*—The first beginning of epithelial tumours is an excessive cell-formation, a true hyperplasia of the epithelial layer of the conjunctiva or cornea. Though this is not agreed to by all writers on the development of epithelial growths, I must maintain it for these tumours taken from the human eye. Epithelial tumours of the cornea do not seem to originate indiscriminately at any part of the corneal tissue, but only at the corneo-scleral junction, or more especially where the layer of Bowman is split into fibrillæ, which are lost in the adjoining conjunctiva, and the corneal epithelium goes over into that of the latter membrane. In a normal eye the epithelium here dips into the under-

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lying tissue in the shape of two or three wave-like papillæ, and this appears to be the very starting point for the epithelioma of the cornea.

If the hyperplastic part of the epithelium has reached the size of about a pin's head (phlyctænula) we find little beyond a thickening of the epithelial layer, due to a greater number of cells. These cells are not so distinctly separated in the three normal kinds of corneal or in two of conjunctival epithelium, but vary in size and shape. In some cases they are altogether serrated, and these seem to be the fast advancing tumours; in other cases the cells are mostly flattened and horny, these advance very slowly. The cells have a large round or oval nucleus, and frequently show nucleoli. If the tumour is of the slow growing kind we often find the well-known pearly nodules, consisting of horny cells concentrically arranged like the skins of an onion.

The next stage of the disease is when the underlying corneal or conjunctival tissue becomes hyperæmic, and shows a large and abnormal amount of round cells.

When speaking of tumours, we are accustomed to combine with the zone of inflammation (or infiltration) around them the idea of a zone of propagation, as, for instance, in sarcoma. In speaking of epithelial growths, however, we have not generally adopted this idea, few believing the zone of inflammation to be also the one of propagation. The reason for this has been the old dogma, that epithelium can only be formed from pre-existing epithelium, as connective tissue only from connective tissue, though among the latter tissues the strangest transformations are not unfrequently found, and are generally looked upon as natural and undoubted.

The examination of the epithelial tumours of the eye has, at least in my opinion, shaken this old dogma. If the tumour advances it grows over the corneo-scleral margin, first upon Bowman's layer, which latter has a considerable resisting power. At the same time vessels are formed in the parenchyma of the cornea, together with a new formation and exudation of round cells; the lamellæ thus become loosened and are more apt to be invaded by the tumour. Later on, the epithelium grows into the underlying tissue in the shape of the well-known cylinders, and enters the cornea at the corneo-scleral margin before Bowman's layer is altered. The perforation and consumption of

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Bowman's layer is accomplished only when the tumour has already invaded a large part of the corneal parenchyma. Descemet's membrane resists much longer. Even if the entire parenchyma of the cornea is destroyed, this membrane and its endothelium are sometimes found unaltered. The sclerotic is taken up by the tumour in the same way as is the cornea. The minute conditions during the progress of the tumour of which I have just given a brief sketch, are the following: Let us consider the tumour as having originated in the bulbar conjunctiva and as spreading over the other membranes. In many cases the surface of the tumour is ulcerated, and we find the tissue changed. If the surface is not ulcerated, it is composed of a thick layer of flattened, sometimes horny, epithelial cells. Underneath these flattened cells we find numerous layers of serrated cells varying in size and shape. The main mass of the tumour is altogether made up of these cells. They have a large round nuclei and frequently one or more nucleoli. From this superficial part of the tumour the primary epithelial cylinders run into the deeper parts, imitating the formation of glands in the well-known manner. The tissue between these primary cylinders is filled with vessels and many round-cells. These latter lie close to each other, vary considerably in size and shape, and have from one to four nuclei. Among them we find a great number of free nuclei. The vessels are mostly of capillary structure. The outlines of the primary cylinders are mostly well defined, and their periphery is formed by one layer of cylindric, spindle, or cone-like, serrated cells, whilst the cells which fill the cylinder are of different shape. In old cylinders we frequently find pearl nodules. If we move our specimen under the microscope along the course of these primary cylinders we see that some of them end with a sharply-defined margin in the underlying tissue. Others, however, pass over into cylinders consisting of round cells and then are lost in the mother tissue, whilst a third kind goes over into secondary cylinders. While the tumour has thus grown more deeply into the mother tissue, the latter becomes transformed in such a way that it consists uniformly of fine, long, delicate spindle-cells with long, oval nuclei. Between these lie numerous round cells and vessels. If we now follow the secondary, tertiary cylinders and so on, we find the following: The farther from the starting-point, the smaller are the

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cylinders. They have, like the primary ones, either sharp outlines, consisting then entirely of epithelial cells, or end in cylinders which contain only round-cells, which are lost in the surrounding tissue. Moreover, we find in some instances the entire network of tertiary cylinders consisting of round cells, arranged in the same way as the epithelial cylinders are, and well distinguished from the surrounding tissue. At the branching angles of these round cell cylinders a number of cells sometimes appear which bear an epitheloid character. I found also a number of cylinders whose periphery was formed of a layer of serrated epithelial cells whilst the axis was stuffed with round cells.

The blood-vessels which lie between the cylinders are frequently surrounded by a great number of round cells, some of them having a mantle of epithelial cells.

I must state here that in very few instances could I find epithelial cells showing undoubtedly the conditions of proliferation. Whilst I record this astonishing fact concerning the epithelial cells of epithelial tumours, I must, on the other hand, state that the round cells, whether they lie arranged in cylinders or are scattered in the mother-tissue, show all the particulars of what we call cell-proliferation. We find among them free nuclei, round cells with one nucleus, which are smaller than white blood corpuscles, round cells with one or two nuclei, resembling in size, shape, and structure the white blood corpuscles, and others which are much larger which have as many as four nuclei.

Muller's hardening fluid, in which all the specimens had been preserved, has the peculiar ability to stain epithelial cells much darker than the surrounding tissues. Thus the specimens are very clear, and, though I have not been able to find cells which would have proved the transformation of round cells into epithelium, there appear cells among the round cells, which assume the tint of the epithelial cells, and are similar to the epithelial cells in their shape. These epitheloid cells I found mostly at the angles where smaller round cell cylinders branched off from larger ones.

The foregoing relates to the conditions found in the conjunctival part of the tumour.

If the tumour invades the cornea, it enters the parenchyma at the corneo-scleral margin underneath Bowman's layer, producing the same changes as in the conjunctival tissue. We find the mother-tissue transformed into delicate, long, spindle cells between

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which vessels round cells and the secondary and tertiary cylinders are lying. Knapp, Classen, and others, state that the tumour in progressing grows along the pre-existing corneal canals. Of course the possibility of this fact cannot be denied, and the general arrangement of the cylinders leads to this supposition. But, in the later stages, this mode of development is decidedly not the rule, since the cylinders run through the tissue without any regular arrangement, and, besides this, after the transformation of the mother-tissue, there are no canals left.

Concerning the relation between round cells and epithelial cells, round cell cylinders and epithelial cylinders, we find absolutely the same pictures in the cornea and sclerotic as in the conjunctiva.

In all the cases I examined the number of blood-vessels was comparatively small, and I never saw a picture which could have supported the idea of Classen, that the epithelioma is propagated by the blood-vessels. If the tumour has taken up the whole of the corneal parenchyma, Bowman's layer is totally wanting. If the tumour has invaded only a part of the corneal parenchyma, we find a partial destruction and consumption of Bowman's layer. This destruction progresses from the corneo-scleral margin towards the centre of the cornea, but, as a rule, does not reach as far as the tumour does. In the latter case it is wavy and curled in the way we see it after injuries or ulcers, and the thickened epithelial layer follows all its windings.

Descemet's membrane resists much longer, and the tumour may have destroyed the whole cornea without having altered this membrane. More frequently, however, it is perforated in some place or other by an ulceration, which is mostly combined with an increase of intra-ocular pressure. The perforation may take place with such power that the lens-capsule is ruptured or the whole lens expelled. In nearly all cases the iris at least is thrown between the lips of the perforated parts of the cornea, and an anterior synechia is formed. It thus happens sometimes that the tumour grows over the iris and, perhaps, later on enters the deeper membranes of the eye. Such a condition, however, I found only in one eye. The whole cornea was taken up by the tumour, and, when the perforation had occurred, the lens had been expelled and the iris incarcerated in the canal of the perforation. The tumour had then entered the eye by spreading over the anterior and posterior surface and the parenchyma of the iris itself.

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Another, probably more frequent way, which I have had occasion to see in two eyes is that of the tumour growing along an anterior ciliary artery. It thus enters not only the ciliary body, but also the choroid, and, later on, may invade all the tissues of the globe.

If I now recapitulate what I learned by studying the conditions of the epithelial tumours of the anterior third of the eye-ball, I must state the following:

The first beginning of an epithelial tumour is a localized hyperplasia of pre-existing epithelial cells.

This hyperplasia, acting like a foreign substance, keeps up a constant irritation of the underlying tissue which leads to inflammation and destruction of the latter, and enables the epithelial cells to invade it. Whilst this is going on, the mother-tissue is transformed into a uniform mass of spindle-shaped cells, between which numerous round cells are scattered. The epithelium grows into this mother-tissue in the shape of cylinders, which, later on, by branching off form secondary and tertiary cylinders and so on. The growing of the epithelial cylinders is due to the proliferation of the epithelial cells, but not to that alone. *The formation of round cell cylinders and their partial transformation into epitheloid cells*, and all the different pictures which I have described, *show that the connective tissue itself is also acting in the formation of epithelium.*

Though these conditions have been found in the tissues of the eye-ball, they may unhesitatingly be applied to the other tissues of the human organism. I may further add, that the epithelioma of the eye-ball is liable in the same way as others to retrogressive metamorphosis, the colloid being probably the most frequent.

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OPTICAL DEFECTS.

BY

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That the eye, as an organ composed of various tissues, is the seat of different diseases to which other parts of the general organism are subject, and that some of these affections often produce more or less impairment of vision, is a fact universally known; but it is not so widely recognised that an eye free from disease, and seemingly perfect, may, by virtue of its character as an optical apparatus, be so defective as to render the sight very imperfect, and incapacitate the subject for the proper discharge of the duties of life.

To refer to some points of practical importance relating to the nature, causes, effects, and treatment of "optical defects" is the object of this paper. It will be necessary, however, to premise a few remarks on the normal construction and action of the eye as a visual organ.

For the distinct perception of objects their images must be accurately focussed by the refractive media on the retina, which must be at a given distance from the cornea; and the normal eye is so constructed that rays of light from distant objects or those more than twenty feet away, namely parallel rays, are converted into images upon the retina, and such objects are distinctly seen, without any visual effort, that is when the eye is, so to speak, "at rest," or "at ease." But, in regarding near objects, as in the act of reading, sewing, &c., the eye is no longer passive, for, on principles of optics, some increase of its refraction must occur in order that the divergent rays, which proceed from such objects, should be focussed on the retina. The process by which this change is produced has been termed the "accommodation of the eye"; and it was long a vexed question with physicists and physiologists in what it consisted. Some held that the antero-posterior axis was temporarily lengthened by lateral compression of the globe, owing to the contraction of the ocular muscles; others thought that the iris

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was the main agent, and so on. But the occurrence, on the one hand, of paralysis of the recti, and, on the other, of complete absence or loss of the iris, the vision for near objects remaining the while unimpaired, disproved these theories; and it was finally shewn that the increased refractive power of the eye when at near work was due to an increase in the thickness and therefore in the focal strength of the crystalline lens, effected through the medium of the ciliary or intra-ocular muscle. The increase in the refraction of the eye in turning from a distant to a near object, as the page of a book at eight inches off, would be equal to the focal power of an eight-inch convex lens, and can be kept up by the normal eye almost incessantly for hours consecutively without discomfort. This effect necessarily depends on a greater or less plasticity of the lens. Hence at a certain though variable time of life the accommodative power becomes impaired, and it finally ceases, owing to the physiological density or hardness of the lens,—and not to the progressive flattening of the cornea as is popularly supposed. This condition, termed *presbyopia* or far-sightedness, is relieved by placing a suitable convex lens before the eye. The nearest point of distinct vision for adults, for the finest type, *e.g.*, is at eight inches, and is technically termed the "near" point; the farthest, the "far" point; and the distance between the two gives the range of accommodation. These data are obtained by the use of = diamond or very fine print; and the visual acuteness by so-called *test-type*. In Snellen's test-types which are largely employed, square letters are used, the limbs of which have a diameter equal to one-fifth of the letter's height. Such letters are clearly distinguished by the normal eye at an angle of five minutes. The eyes are tested separately at a certain number of feet from the test-card; and, having the data as to the respective distances at which the letters can be distinctly recognised by the normal eye, the visual acuity is quickly found. For example, in a given case, the smallest letters that can be distinctly seen at twenty feet are those which can be recognised by the normal eye at one hundred feet; the visual acuity is then $\frac{20}{100}$, or $V = \frac{1}{5}$. It is a fact of some significance that the ciliary and internal recti muscles are intimately related by innervation and in functional activity, and that the process of accommodation also includes as a rule more or less convergence of the optic axes.

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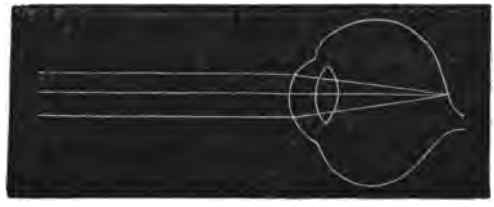
Now it is plain that if the retina be abnormally near to or far from the cornea imperfect vision must result. As a matter of fact there are two principal departures from the normal physical standard: in the one class the eye is too shallow, the antero-posterior diameter being too short; in the other the axis is too long. In the first, parallel rays of light, *i.e.*, from objects twenty feet or more away, would form images behind the fundus, were the eye at rest and the tunics transparent; and, therefore, distinct vision for any distance is only to be had by increase of refraction through the action of the ciliary muscle. And such an eye to be really at rest in seeing far objects must have convergent rays, which rays we know are only had by artificial means, as, *e.g.*, convex lenses. Objects at a greater or less distance are seen relatively with more distinctness than those close at hand; and the term *hypermetropia* (hyperopia) or over-sightedness is given to this defect. Again, in the second class, in which the eye-ball is more or less elongated, the rays of light striking the cornea must be divergent in order to form images on the retina, and give distinct perception of objects. Now divergent rays are such as proceed from near objects; hence the "near" or short-sighted eye, which cannot unaided see distinct objects, requires the aid of a concave lens to render the impinging rays of light more or less divergent,—a condition termed *myopia*.



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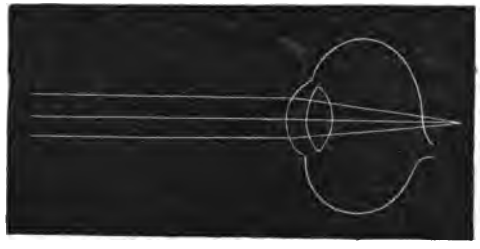

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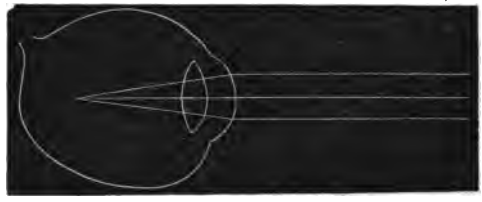
Fig. 1 represents the emmetropic or normal eye; fig. 2, the hypermetropic; and figs. 3 and 4 the myopic.

The third and last optical defect depends, as a rule, on faulty curvature of the cornea, the optic axes in the lines of different



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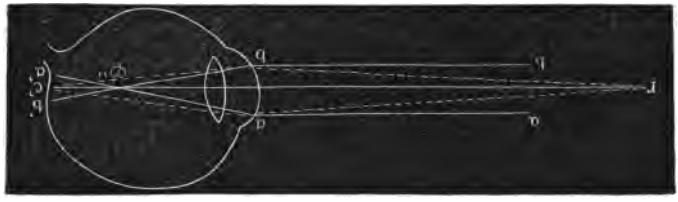

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corneal meridians differing in length; and two planes in any direction at right angles to each other present the extremes of refraction. Since true images cannot be formed, perfect vision is impossible by the naked eye; and, because the refractive media cannot focus rays of light to a *point*, the term *astigmatism* is applied. The eye-ball is always myopic or hypermetropic in at least one meridianal plane. Several varieties occur: in *simple* astigmatism the eye is normal (emmetropic) in one meridian plane and either myopic or hyperopic in that at right angles. In *compound* astigmatism the same defect, either myopia or hyperopia, in different degrees, is present in both principal meridians; while in *mixed* astigmatism both optical defects, M. and H., co-exist in the same eye; so that if the vertical corneal meridian, *e.g.*, be myopic the horizontal would be hyperopic, and *vice versa*. It is evident, therefore, that ordinary spherical lenses which produce regular refraction will not correct this defect, but only such as affect unequally the rays passing in different axes, namely, cylindrical lenses. The distortion often produced by the irregular surfaces of common window-glass will give some idea of the

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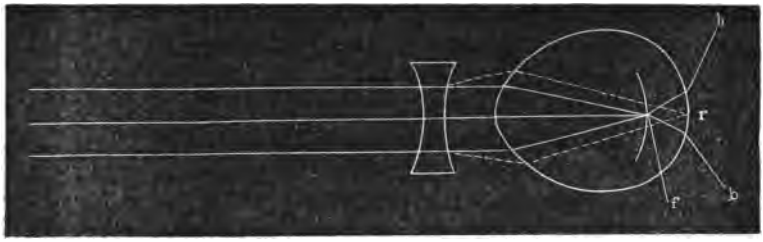
defective or erroneous perception of things by the astigmatic eye. The term *ametropia* is applied to the defects, hyperopia, myopia, and astigmatism; and *emmetropia* signifies the normal refractive state.

MYOPIA.



The presence of this defect even in moderate degree is shewn by the fact that the far point is nearer the eye and the range of accommodation is shorter, than is the case with the normal. Vision for near objects in all uncomplicated cases is good or perfect, that for far is imperfect or very defective, but is decidedly improved or rendered normal by suitable concave lenses. The degree of the myopia, and also the strength of the lens that will most improve the sight, is approximately given by the distance in inches of the far point from the eye. Thus if diamond type cannot be seen distinctly further than six inches, a—6 lens would render vision about normal, and M $= \frac{1}{6}$. Clinically, a partial closure of the eye or nipping of the lids in scanning objects is an indication of its presence, which may, moreover, be detected, and the degree of the myopia determined, with the ophthalmoscope. The retinal vessels of the myopic eye can be seen at a foot or more away with the ophthalmoscopic mirror alone; and if the observer's head move to one side, the aërial image is seen to move in an opposite direction, being inverted; and the focal length of the concave lens behind the mirror in the direct examination which shews most accurately the fine retinal vessels or choroidal pigment at the fundus, increased by the distance apart of the two eyes used, gives the degree of myoia. Thus if a—4 lens be required behind the mirror held at 1 inch from the observed eye, or rather from its nodal point situated in the lens, then M $= \frac{1}{4}$. Temporary short-sight, or so-called intermittent or periodic myopia, sometimes results from protracted contraction of the ciliary muscle, causing prolonged thickening of the lens. This is

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not, however, true myopia, but spasm of the ciliary muscle, and is relieved by the paralyzing effect of a 4 gr. ad. ʒ 1 Sol. Atropiæ instilled into the eye. But as this condition does exceptionally persist *per se*, and as it is moreover often the first step towards the development of myopia proper, its character should not be overlooked. In true myopia then, there is a mal-formation of the eye. It is ellipsoidal instead of being more or less spherical. Its axis is too long, by virtue of the process of extension and thinning which involves the posterior two-thirds of the sclera, and not from bulging or undue prominence of the cornea. In many instances, especially where it is of high degree and hereditary or congenital, in addition to too great length of the optic axis, there is a localized yielding or bulging of the sclera near the optic nerve foramen, termed posterior staphyloma. A pit or conus is thus formed, and partial atrophy of the choroid sooner or later occurs; when with the ophthalmoscope we can see the sclera through the retina as a whitish crescentic patch bordering the optic disc, forming the so-called myopic arc or crescent, with the retinal vessels clearly defined on the white back-ground, like red lines on white paper.

Owing to some exciting cause, as excessive use of the eyes, especially where there is an hereditary predisposition to the defect, an irritable and congestive state of the ocular tunics may supervene; the use of the eye causes much discomfort or reflex neurosis (asthenopia), and photophobia and photopsia are present; the nutrition of the vitreous through the medium of the choroid becomes impaired, and muscæ volitantes appear; a yielding of the sclera, with more or less thinning or diffuse atrophy of the choroid and increase of the crescent, and, perhaps, of the conus, occur; and secondary changes in the retina ensue, sometimes involving the region of the macula or area of acutest vision, and occasionally ending in detachment; the sight becomes more and more defective, sometimes rapidly so; and rarely glaucoma is induced as a complication. This morbid condition, in greater or less degree, is termed *sclerotico-choroiditis posterior*, *sclerectasia posterior*, or *progressive staphyloma posticum;* and, as the organic changes present may persist and the vision be permanently impaired, prophylaxis is important if not imperative in myopia. The popular idea that short-sighted eyes are "strong" is quite fallacious. The myopic eye is not as a rule a healthy organ, but is often a weak and irritable one, prone to the increase of the defect

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and the development of secondary conditions which imperil the sight. Again, owing to the ellipsoidal form of the myopic globe, and its undue length, the convergence required to fix the eyes upon things that have necessarily to be brought close, gets increasingly difficult, the internal recti become relatively weak or possibly are absolutely so, and divergent squint ensues. This result in the progressive myopia of adolescents can be averted by appropriate lenses and hygiene; but it is not an unmitigated evil in high degrees of the defect, for there is the compensating advantage that the eyes can be used separately with comparative ease at close work, upon which the axes of both eyes could not be converged without undue strain.

Myopia is commonly hereditary or congenital. It is also, unfortunately, very often acquired, though in such cases, too, the predisposition to it would seem to be very general, if not invariable. Indeed the frequency of the defect confirms this statement, as does also its occurrence in eyes originally hypermetropic; for its development requires an extension of the sclera, which is naturally surprising, in view of the inherent toughness of this tunic. However, the fact is the more explicable when we consider that myopia generally develops in adolescence, during which period tissue changes are active; and softening and extensility of the sclera would the more readily result from its congestion and the external pressure of the recti muscles during long continued convergence of the visual axes. At any rate, the fact is undoubted that a rapidly increasing percentage of myopic eyes is to be found in all civilized countries, especially where education is begun quite early in life, or is too forced and persistent a process. Myopia prevails in towns and cities, at literary centres and seats of learning, and occurs seldom in rural districts. The most potent cause, probably, is abnormal and long-continued tension or straining of the accommodation of the eye, rendered necessary during the course of general or special education by the attempt to neutralize the effects of deficient or ill-directed illumination, defective print, and badly planned school apparatus or office furnishings, by means of too close approximation of the head to the object; the congestion of the globe induced by oft-repeated and protracted stooping or leaning forward over books, low desks, etc., materially aiding in developing this condition. There is certainly a wide field and promising harvest for the exercise of a wise philanthropy in correcting the abuses of school life. It is true, much attention

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has been given to the hygiene of scholars and to the construction of schools and colleges on scientific and sanitary principles, and that some care has been bestowed on the prevention of such evils as ill-development of the chest and lungs, curvature of the spine, acquired struma from vitiated air, etc., etc., but the organ which is directly taxed the most and does the best service has been largely overlooked. Fortunately our profession is coming to the front in increasing numbers, as members of education boards, school committees, etc., and we may, therefore, hope that, ere long, all school rooms, besides possessing other desiderata, will be well lighted by large-sized windows, and have the desks and seats so constructed as not to necessitate a stooping position, and so placed as to have ample *lateral* illumination. It is important to note also that cheap school books are dearly bought if the rising generation be thereby compelled to read quantities of bad print crowded upon small pages of poor paper. Bad type, especially in indifferent light, compels the reader to bring the book too close, and thus favours myopia. The very defective illumination and arrangement of desks to be commonly found in law offices, and the immense quantity of manuscript to be indited and read, furnish the key to the increase of myopia amongst those who are crowding into the ranks of the legal fraternity.

Moreover, it would certainly seem that it is time to inaugurate a more rational system than that which too commonly prevails, not of *teaching* children too much, but of compelling young folk, whose eyes and other organs are in a more or less plastic state, to spend hours in taxing eye and brain at and over lessons, by uncertain or artificial light, it may be, after spending the greater part of their school hours in reciting what had been learned by extra work on the previous day. The fact is pertinent that optical defects, more especially myopia, are much less frequent in Great Britain than in Germany and the United States, for example, where education is, as a rule, a thing of quicker growth, and is begun in earnest earlier in life. Canada, which has already won a high position educationally, should shun the "errors" of refraction, the seeds of which it is to be feared are already being widely sown; for it would be, indeed, a "short-sighted" policy were Canadians to purchase education and culture at the price of a defect, which entails through life more or less disability,—increased by heredity—and is itself not infrequently a bar to the attainment of lucrative and honourable positions.

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That these remarks are not ill-timed or unwarranted will appear from the results of the careful examination of many thousands of cases, made by competent observers in Europe and America. Donders, to whom the profession are under a lasting tribute for his classic work on the "Anomalies of Refraction and Accommodation," asserts with special emphasis that "a near-sighted eye is not a sound eye. In it there exists more than a simple anomaly of refraction;" there is a morbid stretching of the tunics, "and, if this extension has attained to a certain degree the membranes are so attenuated, and the resistance is so diminished, that the extension cannot remain stationary." "In youth myopia is almost always progressive; the increase is then often combined with symptoms of irritation. This is the critical period for the myopic eye; * * * if the myopia becomes developed in a high degree it is subsequently difficult to set bounds to it. Every progressive myopia is threatening with respect to the future. If it continues progressive the eye will soon, with troublesome symptoms, become less available, and, not unfrequently, at the age of fifty or sixty, if not much earlier, the power of vision is irrevocably lost"—from the secondary changes already mentioned.

Donders quotes Ware, to the effect that, in the colleges of Oxford and Cambridge, a considerable proportion of myopes was met with;—in one college at Oxford, thirty-two out of one hundred and twenty-seven.

Dr. Cohn, whose researches are largely quoted by various authorities, some years ago carefully examined the refractive condition of the eyes of ten thousand children in the lower, middle, and upper schools of Breslau and other places in Silesia. He had previously found that, of seven hundred and fifty near-sighted people examined within four years, four hundred had some more or less serious complication dependent on short-sightedness. Of the ten thousand children he found one thousand seven hundred and thirty with defective vision, making 17·1 per cent. —the average number increasing with the demand upon the eyes at school. In the city schools there were four times as many children with defective vision as in the country. And of the ten thousand, there were three times as many cases of optical defect, namely, myopia, hyperopia and astigmatism, as of other troubles. Now, of the one thousand three hundred and thirty-four cases of abnormal refraction, one thousand and four were myopia. From

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the data he collected, Cohn concluded: "1. No school was without myopic scholars. 2. In the village schools there were very few (1·4 per cent.). 3. In city schools, eight times as many (11·4 per cent.) 4. In city elementary schools four to five times as many as in village, (6·7 per cent.) 5. In the city schools there is a steady increase of the number of near-sighted children from the lower to the upper grades. 6. In the middle schools, one-tenth, and in the highest, more than one-fourth of the children are near-sighted." And of four hundred and ten students selected at random at the Breslau University, not one-third had normal eyes, and nearly two-thirds were myopic; and the defect increased with the age and the number of terms of student life.

These conclusions coincide with the statistical results of the examination of the vision of school children in several cities of the United States, made at the instance of Dr. Agnew, of New York, and tabulated by Dr. Webster. Of 1264 scholars in Cincinnatti examined by Drs. Ayres and Williams,—in the district schools, 13·3 per cent. were near-sighted; in the intermediate, 13·8 per cent; and in the normal and high schools, 22·8 per cent. Of 600 boys at the Polytechnic, in Brooklyn, examined by Drs. Prout and Mathewson, 9·2 per cent. of those in the academic, and 21·8 per cent. in the collegiate department were myopic. Dr. Cheatham examined the eyes of 1020 boys in the college of the City of New York, and of 670 in the introductory class found 21·9 per cent. near-sighted; of 210 freshmen, 26·2 per cent.; of 110 sophomores, 22·7 per cent.; and of the 30 juniors, 50 per cent. "Staphyloma posticum, one of the gravest organic changes in progressive near-sightedness, increased from 0·5 per cent. in the district schools to 7·6 in the intermediate, and 10·4 in the normal and high schools. Out of about 1000 scholars in one of the large schools, examined with the ophthalmoscope, the eyes of 703 were found to deviate otherwise than in refraction from the normal standard.'' Extensive observations by Dr. Loring, of New York, also confirm the various points already adduced.

Bearing in mind that the predisposition to myopia is so common and the tendency of the defect is always progressive, and that the characteristic scleral staphyloma with the choroidal and other complications do not generally occur before puberty, the mportance of prophylaxis will be apparent. Especially in the case of children whose parents are myopic should all causes of venous stasis of the globe by protracted stooping, etc., be avoided,

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and also compression of it by long and marked convergence of the visual axes. A ban should be put upon close work by dim or flickering light, reading while recumbent, or in a prone position as by the blaze of a grate fire, etc. The engaging at work or in an occupation which taxes the eye, the reading of "cheap" books, protracted study, etc., should be avoided, and the eyes should have an occasional rest if any discomfort be felt after using them for a time.

The early resort to suitable correcting glasses has an undoubted influence in preventing the progress of myopia; and here again the popular prejudice has to be met and combatted.

In low degrees of the defect, where, *e.g.*, small type can be read, at 18 or 20 inches, the weakest concave glasses that render far vision normal should be worn, except during close work, when they may be dispensed with if their use proves uncomfortable or unsatisfactory. When small type cannot be recognized at 18 inches, and the far point is between 18 and 10 inches, the eye being otherwise healthy, it is advisable to use the correcting glasses constantly; and in those of thirty years and under, the defect may be wholly neutralized, either at once or within a short time. So that, for example, a youth who could not read small print further off than 10 inches would be given for constant wear a pair of spectacles with —10 lenses, which would render far vision normal, and small type legible up to 20 inches or more, and "music" from 24 to 30 inches. And under proper hygiene and the habitual wearing of these lenses practically normal vision might be preserved until the age of forty or forty-five, when the glasses would be laid aside for close work, still being retained or a weaker power used for other purposes. If the subject be thirty-five or forty years of age, a somewhat weaker glass should be adapted, namely, the strongest with which near vision could be exercised with comfort. Again, where the far point is at five inches, M $= \frac{1}{5}$ or less, and the visual acuteness is good, concave glasses which remove the far point to twelve or sixteen inches, rendering small print legible at that distance, may be given for constant wear, supplementary glasses being also ordered for occasional use before the spectacles so as to render distant vision about normal; or, preferably in some cases, stronger lenses, which nearly neutralize the myopia, may be worn ordinarily, the lower power being used for reading, or other close work. It is a matter of some moment not to prescribe lenses that are too strong. They

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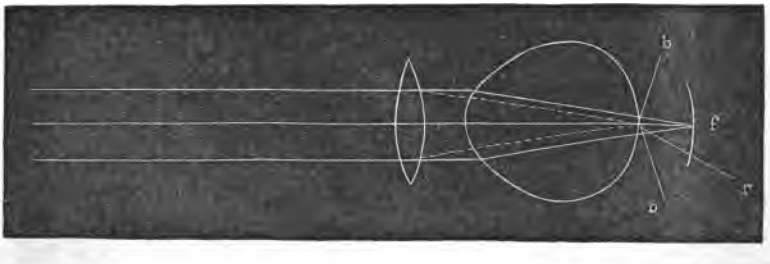
develop asthenopia, and also favour the increase of the myopia. And it is desirable to have the spectacle frame so adapted that each glass shall be near the eye and its centre opposite the pupil. Where the acuteness of vision is somewhat impaired (amblyopia) close work, except casually, should be proscribed, and the weakest lenses which render near vision most satisfactory should be then used; but, if marked amblyopia exist, spectacles should not be worn for near objects. As far-sightedness (presbyopia) is considered to begin when the near point has receded to more than eight, or at least ten, inches from the eye, many myopic eyes, M less than $\frac{1}{10}$ or $\frac{1}{8}$, may become subject to presbyopia; and, as age creeps on, even convex glasses may be requisite for near work. Actively progressive myopia is best treated by ordering disuse of the eye during the periods of irritation, by the use of evaporating lotions to the lids, counter-irritation, or local depletion, and the avoidance of exciting causes. In cases where undue tension of the ciliary muscle is suspected, paralysis of the latter should be maintained by the periodic instillation of a 4 gr. ad. ʒ j. sol. atropiæ sulph.; and in other instances again, tenotomy of the external rectus is required to correct the developing squint or lessen compression of the globe. Where muscæ volitantes are increasing and the visual acuity diminishing, and asthenopia with photophobia and other symptoms are present, which indicate sclerectasia-posterior to be imminent, eye-protectors, as "London-smoke" coquilles, should be worn constantly, complete rest of the eyes should be enforced, and all causes of irritation disallowed; and occasional local depletion from the temple practised. In many cases a course of hydrargyri perchlorid. gr. $\frac{1}{40}$ to $\frac{1}{20}$ *ter die*, is highly beneficial, as it improves the nutrition of the choroid and vitreous, and promotes the absorption of effused products, muscæ, etc.

HYPERMETROPIA.



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The presence of this defect is evinced by the fact that far vision, when apparently of normal degree, is not impaired by convex glasses, and, when defective, is decidedly improved or rendered normal thereby. And, even where the sight is apparently normal, the paralysis of the ciliary muscle by atropia, by removing the compensating convexity of the crystalline lens, reduces the acuity of vision frequently to one-half or one-fifth; and the normal standard can only be regained by the aid of convex lenses. The subjects of this defect generally complain that work at near objects, as reading, sewing, etc., is tiresome; the print becomes blurred and the eyes are irritable or ache on reading a while. These and allied subjective sensations (asthenopia) cease on resting the eyes, to recur on using them again.

The degree of *manifest* hypermetropia is shewn by the strongest convex glass with which vision continues normal or is rendered so. The *total* H. is given by the strength of the lens required to raise the sight to the normal after several applications of a 4 gr. ad ʒj. sol. atropiæ, and the difference between the total and the manifest gives the *latent* H., and indicates the extra effort put forth by the ciliary muscle to secure distinct vision of objects more or less distant. Ordinarily it is not necessary, and in many instances it is not advisable, to use atropia, but where, owing probably to more or less spasm of the ciliary muscle from overtension, asthenopia exists and hypermetropia is suspected, and convergent squint is developing, and the tests with convexes or their use proves unsatisfactory, then the accommodation should be paralyzed. Clinically, H. is determined by the ophthalmoscope; and the strongest convex lens behind the mirror with which a normal eye with its accommodation relaxed can clearly see the fine retinal vessels at the fundus, indicates the degree of the H., and measurably the strength of the correcting lens. On using the mirror alone, and moving one's head from side to side, the aereal image of the retinal vessels, optic disc, etc., will be seen to move in the same direction. The ophthalmoscope is sometimes very valuable in the case of young subjects or others to verify or correct the result of the examination with lenses.

Hypermetropia is generally hereditary and congenital; and is also acquired, in low degree, by the physiological hardening and flattening of the crystalline lens in senility, and, in high degree, from luxation of the lens, and also aphakia or loss of the lens by operation or traumatism. It is the principal cause of asthenopia

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or "weak sight." It is also the most common cause of convergent strabismus—about three-fourths of the cases of this form of squint being caused by this defect. It requires for its scientific treatment the physical aid of suitable convex lenses, which enable the eye when at rest to have good far vision, and prevent undue strain upon the ciliary muscle during accommodation. Where asthenopia occurs only during the exercise of the accommodation, the lens which indicates the *manifest* H. should be used during close work, and not ordinarily. Where asthenopia persists or is constant, or periodic squint occurs, the strongest convex with which the sight of each eye tested singly remains normal for distance, should be given for habitual use; the correcting lens being afterwards replaced by a higher power if the asthenopia should recur after temporary relief, or the squint relapse. When far vision is defective the strongest convex lens that raises vision to the normal or most nearly so, should be worn constantly; and, where a latent H. of high degree has been found, lenses of increased strength should be given from time to time as the subjective symptoms indicate or tolerance, so to speak, be established, until the degree of total H. is approximately neutralized. In some instances where there is annoying asthenopia far vision is apparently improved by weak concaves while weak convexes do not impair it. Such cases are deceptive, and actual H. will generally be revealed by the use of atropine, and convexes will be advisable for near work at least. The undue tension of the ciliary muscles required to effect the increased convexity of the cystalline lens, which is involuntarily produced in order to compensate for the shortness of the optic axis, is necessarily associated with excessive contraction of the internal recti, and is the main element in the pathogeny of convergent squint. The abnormal convergence or "cast," often popularly ascribed to the most varied causes, is at first periodic, and is most apparent when the eye regards near objects, as in the case of children handling toys, picture books, &c., and often also during adolescence, when the eyes are unduly taxed in protracted reading, &c. It may be remarked in this connection that it has come to be a recognized rule in ophthalmic surgery not only to cut for squint as soon as it is confirmed, even at a very early age, so as to secure single vision and prevent that great impairment of sight (amblyopia) of the squinting eye, which generally follows strabismus and is owing to active suppression of the retinal images to get rid of

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diplopia, and to protracted disuse of the retina; and also to determine the refractive state of the eye, so as to be in a position to prescribe appropriate convex glasses for the optical defect, which, being a permanent one, is ever more or less potent and frequently requires to be neutralized. The neglect of this precaution has occasioned many relapses after successful operations, and has tended to bring the tenotomy itself into disrepute, and render the resort to it rare compared with the frequency of the deformity; though the result of the modern operation can hardly be excelled, of its kind. Paralysis of the ciliary muscle, and the consequent disuse of the internal recti kept up for months or years by the periodic instillation of a 4 gr. ad. ʒ j. sol. atropiæ, in conjunction with the attempt to enforce the constant wearing of spectacles to correct the hypermetropia, has been practised with some success to remove convergent squint in young subjects; but this course is beset with difficulties which militate against its general adoption. Incipient or periodic squint in those old enough to wear spectacles often yields to treatment by neutralizing the defect, and the strabismus is averted by the constant use of suitable correcting lenses.

ASTIGMATISM.

The presence of this defect may be suspected where small type can be read at the ordinary distance, though with generally resulting asthenopia, vision for distance being more or less defective and not rendered normal by simple convexes or concaves respectively, and there is some uncertainty as to what strength of lens is most helpful. A lamp flame observed with one eye seems high and narrow, or broad and short; or again, the subject has noticed that horizontal lines are seen more distinctly than vertical, or vice versa, etc., etc., as in the case of artisans, builders, architects, etc., in "sighting," gauging, drawing, etc.

It can be clinically detected with the ophthalmoscope by the distortion of the optic disc or the unequal definition of retinal vessels, and some rely largely on this method for obtaining the necessary data. The features of the defect, and the character of the correcting glass, are determined by the use of various *test-diagrams*, the most commonly employed being Snellen's half circle of lines or radii, all of which are alike, and appear sharply defined to the normal eye at 20 feet. Other test-diagrams, dial cards, etc. ingeniously devised by Dr. Green, of St. Louis, are often used.

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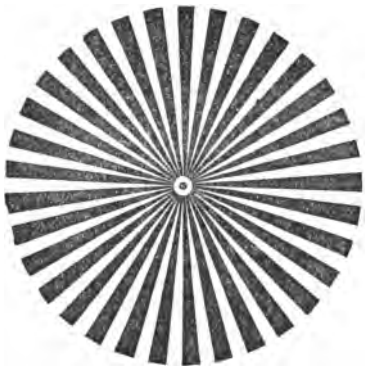

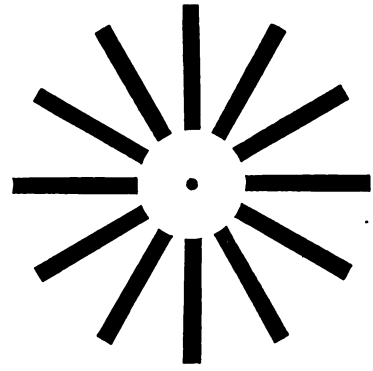

To illustrate, take a case of simple myopic astigmatism :—

G. H. C., a medical student, complains of asthenopia. Right eye, visual acuteness $\frac{10}{xxx}$, or V = $\frac{1}{3}$; reads fine print from 4 to 15 inches; at 20 feet off the vertical lines of the test card appear black and well-defined, the rest indistinct and greyish. With a concave cylindrical lens, —40, axis horizontal, V = $\frac{20}{xx}$ or normal, and all the radii of the half-circle are clear and black, and small type can be read up to 24 inches. Left eye,—V = $\frac{10}{xxx}$, far point at 15 inches, vertical lines only distinct: with—50 cylindrical, axis horizontal, V = $\frac{20}{xx}$, all the radii distinct, and far point at 24 inches. Ordered a pair of spectacles, right lens, —40 cyl. axis horizontal, left lens —50 cyl. axis horizontal, to be worn constantly. As this was a case of myopic astigmatism, the weakest glasses which rendered vision normal were given.

Compound astigmatism.—Miss H. has asthenopia on trying to read music or ordinary type, and the defect is increasing. Right eye, V = $\frac{7}{200}$, far point, 9 inches; with—10 lens, V = $\frac{10}{xx}$ and sees only the horizontal radii clearly, and with —7 only the vertical. Left eye, V = $\frac{15}{200}$, near point 15 inches; with—20, V = $\frac{10}{xx}$ and only horizontal lines black, and with —12 only the vertical. Therefore the right eye is myopic about $\frac{1}{10}$, the second principal meridian being $\frac{1}{7}$, difference = $\frac{1}{7 \cdot 1 \cdot 3}$; and the left eye about $\frac{1}{20}$ and the second principal meridian $\frac{1}{12}$, difference = $\frac{1}{30}$. After testing, the following combination was found to render vision *normal* and to be most suitable for all purposes: R., right lens, —10 (+) —40 cyl. axis vertical; left, —20 (+) —50 cyl. axis vertical, to be worn constantly. Mixed astigmatism.—Master B., æt. 15, complains of defective sight, and marked asthenopia on using eyes at his books. Right eye, V =

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$\frac{3}{100}$, reads small type from 3 up to 7 inches, with—12 lens V = $\frac{20}{20}$; eye under atropine requires 30 inch *concave* to see any radii, namely the oblique, and with 14 inch *convex* sees most distinctly those at right angles. The eye is therefore myopic in one principal meridian, hyperopic in the other and somewhat amblyopic. Left eye, V = $\frac{3}{100}$; and there is simple myopic astigmatism with amblyopia. With the ophthalmoscope the amblyopia is found to depend on an old optic neuritis secondary to brain trouble, which his father says he had in early childhood. Ordered spectacles, to be worn constantly, with right lens, —30 (+) + 16 cyl. axis oblique; left lens, + 20 cyl. axis oblique. With these V = $\frac{20}{20}$ right eye, and $\frac{20}{30}$ left, and patient could read fine print from 4 inches up to 14.

Asthenopia or "weak" sight embraces a group of symptoms, of which more or less painful fatigue of the eyes on using them is a prominent one. Hypermetropia is the principal cause, as already explained. It is also due to myopia and astigmatism. In astigmatism two acts of adjustment, one for vertical and the other for horizontal lines, would be requisite to secure distinct perception of each letter in reading, and the extra work put upon the ciliary muscle readily accounts for any subjective annoyance. This *accommodative* asthenopia, as it is termed when arising from ametropia, requires for its relief the correction of the existing optical defect. When occasioned by absolute or relative weakness of the internal recti, it is styled *muscular;* and *retinal* when depending on optic nerve or retinal hyperæmia, hyperæsthesia, etc. The last-named conditions are, however, more often the result than the cause of asthenopia. It also results from the strain put upon the ciliary and internal recti muscles in the effort to atone by the nearness of objects for some degree of amblyopia caused by a nebulous cornea from former ulceration, etc., or an old optic neuritis. To detect the so-called insufficiency of the internal recti, the eyes are directed upon an object, as a pencil, in the mesial plane and on their level, which is then gradually approximated. A rolling out of one or other eye on moving the object close up indicates the muscular defect. It is also shewn when on placing a prism with base upwards before one eye there is lateral as well as vertical displacement of the image of the object regarded, as e. g., an ink line with dot on a card held at reading distance. It is a complication of myopia, as a rule, arising chiefly from the elongated and ellipsoidal form of the globe, especially in

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high degrees of this defect, and it often issues in divergent squint. It is relieved and the squint averted in many cases by adapting the proper concave lenses, which in some instances have also to be combined with prisms with their bases turned in. But in other cases a careful tenotomy of the external rectus is required. Muscular asthenopia is also a rare complication of hypermetropia. Asthenopia is a condition of common occurrence where the system is in a state of enervation. It is thus often evoked in childbed or during lactation, after diphtheria, in anæmia, etc., especially if the eyes have been taxed. The subjective symptoms are varied, and embrace:—pain in and around eye, a tired, sleepy feeling, frontal headache, or even cephalagia. Indeed the headache is occasionally of so serious a nature as to lead one to suspect cerebral mischief. Some notable cases in point were published by S. Weir Mitchell, (American Journal of Medical Sciences, April, 1876,) in which relief was only had by correcting the optical defects which it was found were present. Blurring of print, and confusion or indistinctness of sight on using the eyes at close work are other common symptoms; also discomfort on using the eyes, and inability to sustain the use of the eyes, especially at near work, together with sensations of irritation of the eyes and lids, smarting, lachrymation, etc. Many cases of slight chronic inflammation of the conjunctiva and edges of the eyelids—Blepharitis marginalis—are largely due to ametropia, which requires to be neutralized before this slight but annoying morbid condition will yield to the ordinary topical applications. The most troublesome cases of asthenopia are those in which there is an element of hysteria, that too often renders them more or less inveterate. Chorea has been attributed to ametropia, as the main if not the sole cause, but an extensive series of observations by careful and impartial observers give no support to such an assumption.

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EXCISION OF THE KNEE JOINT.

BY

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Considerable diversity of opinion exists at the present time as to the justifiableness of the operation of excision of the knee joint, and there are those who do not hesitate to condemn the operation as "one which will sooner or later fall into deserved desuetude." With a view of attracting more prominently the attention of Canadian surgeons to the subject of excision of the knee joint, I have prepared this paper, based mainly on the results of that operation as practiced in the Montreal General Hospital during the past twelve years. It must not be considered a reflection on the surgical experience or practical skill of the staff of our Hospital that the performance of the operation of excision should have been so long delayed after the published results of Sir W. Fergusson, Price and others, rather be it looked upon as an evidence of caution, in that the surgeons of our Hospital failed to recognise in cases submitted to their care those suitable for an operation of such magnitude. Let it be remembered that excision of the knee joint is an operation of greater magnitude than that of amputation at the lower third of the thigh. It is more difficult of performance, and the consequent shock is far greater; indeed, if we take the latest published statistics on this point, based on the results of 472 cases of excision of the knee joint, as compared with 431 cases of amputation at the thigh for disease of the knee joint, it will be found that, in the former case, excision of the knee joint, the mortality equals 27 per cent., against 22 per cent. of amputation at the thigh. This is taking an average of all cases, independent of age. Mr. Bryant, however, calls special attention to the greatly increased fatality of excision in young subjects, as compared with amputation. In his table he gives the results of excision in 97 cases, the patients being under twenty years of age; of this number 27 died. On the other hand, out of 69 amputations for chronic disease of the knee joint performed on patients under 20 years, he lost but three by death; which would make excision, when practiced on the young,

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nearly seven times as fatal as amputation in the same class of patients. This result, although favourable to amputation, cannot be wondered at, when it is considered that many of the cases of excision, probably all of them, were submitted to the major operation after a long and exhausting siege of pain, suffering, and prostration of strength, from disease in which the bones entering into the formation of the joint had been implicated.

In considering the various diseased conditions in which the operation of excision may be practiced, we must affirm that much of the success attending this operation will depend on the judicious selection of cases. Sir W. Fergusson makes the following statement: "I myself have been too zealous, and resorted to the operation of excision when I should have selected amputation." In deciding this question we must regard the patient's age, his constitutional condition, and the extent and character of the disease present. Although excision of the knee joint has been practiced with success at all ages, yet it cannot be denied that the most favourable period is during young adult life. Statistics point to the fact that excision in children is seven times as fatal as amputation at the thigh. But in children there is a prominent objection to excision. I refer to the removal of the epiphyses, and the consequent loss of growth in the length of the limb. We must, however, remember that disease of the knee joint in children is commonly attended by arrest of development and that, although the disease may terminate in bony anchylosis, we frequently find the growth of the limb stunted. We may have, after the lapse of years of suffering, a limb very much shorter than its fellow. In proof of this I may cite the case of W. H., published in the January number, 1871, of the *Canada Medical Journal.* In that case, an illustration of which is subjoined, the patient, at the age of 12 years, had suffered from an attack of rheumatic arthritis. The joint became disorganized and pseudo-anchylosis occurred, the limb being bent at a right angle. At the time he came under my observation, he was 23 years of age. There was very slight motion in the joint. The patella was firmly attached to the external condyle of the femur. The limb was perfectly useless for progression, and for his relief I excised the joint, and he made a good recovery with a useful limb. Accurate measurement of the limb before performing excision showed a shortening of two inches in the length of the femur and one inch in the length of the tibia. I am by no means satisfied

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that excision is not a perfectly justifiable measure in disease of the knee joint in children. I have, however, very limited experience to offer on this point, not sufficient at least to influence the judgment in this class.

In December, 1870, I excised a knee joint in a boy, aged 14 years, for chronic disease of ten years standing; and, with the view of saving portions of the epiphyses, in dividing the bones I made use of an ordinary fretwork saw, adjusted in Mr. Butcher's frame. A thin slice of the femur was removed, the end of the bone was rounded off, the entire diseased structure being taken away. The tibia was next attended to, and a thin slice removed, the reverse of that on the thigh bone, so that the two bones fitted quite accurately. For the ensuing six weeks the case progressed favourably, when symptoms of osteo-myelitis set in, for which amputation was proposed. The parents of the boy, however, insisted on taking him home, and he left the Hospital. Since then I have lost all clue to the case, except that I was informed some time back that the boy had recovered with a useful leg, and that he could walk without a stick, but this I cannot affirm from any personal knowledge, as the family live some distance up the Ottawa.

During the summer of 1874, while on a visit to Edinburgh, I related this case to Mr. Annandale of the Royal Infirmary, and he informed me that his practice was to excise the knee joint in children, and that in so doing he removed all the diseased structures with a strong knife, paring off the face of the bones, his object being to save as much of the epiphyses as possible. I have followed the method practised in the first case, as described above, in one other instance —the case being that of a little girl aged 10 years, whose knee joint I excised in 1875. There had been disease of the joint, implicating the bones, of some four or five years standing. The limb was bent at a right angle, and, from softening and relaxation of the ligaments, together with constant traction of the ham-string muscles, dislocation backwards of the bones of the leg had taken place. There was great difficulty after section of the bones and division of the ham-string tendons, in placing the bones in position, so that, to avoid bruising of the ends of the femur and tibia, a second slice had to be removed. This encroached very much on the epiphysis of the femur, and there was only a very small portion of it left behind. We had a great deal of trouble in the after treatment of this case, constant watching and attention being required to carry the child through a long siege of suppuration and threatened pyæmia, but she ultimately recovered,

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and is now able to set the foot to the ground, and bear her whole weight on the limb. She has grown considerably, but the limb does not increase in length in the same proportion as its fellow. This result I do not think is entirely due to removal of the epiphyses or their injury by the operation, since the previously existing disease must have had much influence in arresting the development of the limb. However, the patient has a limb, such as it is, with an ankle joint and foot, both of which, as time advances, will increase in efficiency and usefulness; whereas, had she merely a stump, the result of amputation, her condition would remain ever the same. So much, then, for the influence of age in the results of this operation; not only is it admitted to be most fatal in children, but the other considerations are of the highest consequence, as affecting the after usefulness of the limb in its arrest of development.

Constitutional condition.—I have already stated my conviction that excision of the knee joint is an operation of greater magnitude than that of amputation. From this I fancy there are few that will dissent. It is attended with a much longer confinement to bed, a longer period of absolute restraint in one position (on the back), which is very irksome; besides, we have the long continued suppuration and sometimes the burrowing of matter and formation of sinuses, in all instances requiring constant attention, and being also a great drain on the patient's powers of repair. Hence, in the selection of cases for excision, the surgeon should be careful to ascertain that he has no slumbering evil, no incipient or developed disease of the lungs, kidneys, or other viscera. After excision, the condition of the patient is such, that greater demands are made upon his reparative powers, and upon his ability to resist the long-continued suppuration which so frequently accompanies these cases. "It should be a golden rule," writes Swain, "one of the few without exceptions, that tubercle of the lung contra-indicates excision of the knee." It is true that Mr. Price reports a case of successful excision of the knee in a phthisical patient. This, however, must be regarded, as Mr. Swain truly observes, "as an exceptional case, one of those solitary instances of good luck, and good management as well, because the patient made a rapid recovery." In another case, also reported by Price, the patient developed acute phthisis and died. The condition of the heart and kidneys should always be ascertained before deciding on an operation for excision of the knee. Mr. Savory, on this

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point, remarks, "that damaged kidneys have, as a rule, much more influence upon the result of an operation of any kind, or an injury of any kind, than a damaged heart, although the action of the kidneys is not so immediately necessary to life as that of the heart." It may be looked upon as a rule that recovery from excision is more tedious than from amputation of the thigh. There are some very exceptional instances on record of marvellously rapid recovery after excision of the knee-joint. Therefore, it follows in cases where some of the important viscera are engaged in diseases, and the constitutional ability of the patient is enfeebled, that when, from irritation in the joint itself, the constitutional disease is apparently increased, then indeed should the local malady be removed, and in doing so, the surgeon should select the operation that holds out the best chance for rapid recovery.

Again, in deciding the question of excision of the knee joint, the extent and character of the disease present must seriously engage our attention. While the disease is confined to the soft tissues, no operative measures should be entertained. If the synovial membrane alone is implicated, it would be highly improper to excise the joint. On this point Mr. Cadge of Norwich observes: "It will generally be found useless to remove the ends of the bones when the synovial membrane is the primary and chief seat of the disease." Mr. Price records twenty-one cases of excision of the knee for the removal of diseased synovial membrane, and they were all unsuccessful. In performing excision under such circumstances the surgeon opens a joint in which the principle tissues entering into its formation are unaffected by disease. The shock of such an operation would be very much greater, as it has been found that shock to the general system is greater in proportion to the integrity of the joint. If the synovial membrane is alone implicated, the bony structures are comparatively healthy. The bone tissue with their cancelli are not condensed by disease, and by opening this healthy bone tissue the risk of purulent absorption is greatly augmented. Acute suppuration is not a favourable condition for excisions. This is conceded by most surgeons. Exceptions, however, do occur, and successful results have followed excision in this condition. Mr. Holmes, in his work on the Surgical Diseases of Children, observes on this head, "Excision usually much increases the amount of suppuration, and generally excites a very great degree of surgical fever. Hence I should fear that it would very generally hasten the fatal event instead of

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averting it; so that I have always preferred to amputate, though I do not deny that excision might succeed in occasional cases of acute abscess of joints."

Disease attacking the cartilage of the joint simplifies the question for operative interference. The implication of the cartilage, erosion, or so-called ulceration is soon attended with implication of the osseous structures, if, indeed, the bone is not the first structure implicated, and then follows a train of most distressing symptoms. In these cases we may believe that the integrity of the joint is destroyed. Here the surgeon may seek to secure anchylosis in a favorable position, and no doubt, in time, his labors may be crowned with success; but, in his success, the surgeon cannot restore a perfect knee; at best, he can alone have a stiff knee, and if in a child, most likely a dwarfed limb. But if, as so frequently occurs, a patient is brought to you with a limb flexed at a right angle, with a knee swollen, tender to the touch, with agonizing night startings, so that he awakes from sound repose to utter a cry of pain, all attempts at palliation in such a case will fail. Probably we may have sinuses leading into the joint, or reaching diseased bone; even in such a case anchylosis may sometimes be secured, but in the attempt, after many months of suffering, the patient will most likely be reduced to such a condition that operative measures of any kind will be very hazardous. But let us take the most favourable results, when anchylosis has followed after what we may term the expectant treatment, and it will be observed in very many cases that, after years of misery and constant attention, a hollow peace, so to speak, will have been entered into between the surgeon and the disease, which may at any time be broken. On this point I may quote Mr. Solly, who remarked in a clinical lecture delivered at St. Thomas' Hospital, in comparing the results of anchylosis from what he is pleased to term medical as distinguished from operative surgery: "I must confess that I have been disappointed in some of my cases of natural, as distinguished from artificial anchylosis, by their return to the hospital after I had hoped a complete cure had been affected." From the records of many British surgeons it would appear that in acutely painful articular disease, those cases in which the cartilages and bones are affected are most favourable for excision, and in selecting this operation its advocates recommend its early performance. This would appear to be one element of success:

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to wait long enough to be certain that the disease present is beyond all chance of amendment except by operative interference. Dr. Sayre, of New York, in discussing this subject, recommends that if the disease of the joint is not sufficently extensive to warrant complete excision, you may remove all the dead bone by drilling and gouging; passing seatons of oakum or perforated rubber tubing through the joint for the purpose of securing complete drainage, &c." Dr. Sayre is not very warm in his advocacy of excision, though he by no means condemns it.

Excision of the knee joint has been practiced for traumatic injury, gunshot wounds, both in civil and military practice. In this latter it is not advocated, in fact by many condemned. The chief reason appears to be the danger of pyæmia, which is the military surgeon's most formidable enemy. But more than this, one of the most difficult problems to the practical surgeon is the retention of the bones in apposition in absolute rest to secure union. Hence the surgeon in the field in the face of an enemy, with no permanent hospital establishment, is loath to attempt an operation which requires weeks, if not months of absolute rest to ensure success. On this head I may cite the record given in circular No. 6 from the Surgeon General's department during the American war. There is a table containing the results of eleven cases of excision of the knee for gunshot wounds of that joint with only two recoveries, the others were fatal. This is far from encouraging. In the Montreal General Hospital the operation of excision has been performed thirteen times with the following results:

No. of cases, 13; cured, 9; doubtful, 1; died, 1; amputated, 2.

Some of these cases have already been published in the *Canada Medical and Surgical Journal*, and, without repeating over the details of each case, I shall select as much as will add interest to this paper, and shall call attention to any special feature which may appear of importance.

Case I.—Excision of the knee joint performed at the Montreal General Hospital on 17th May, 1865. The patient was a young man, æt. 18, who had suffered for some years from frequent attacks of synovitis. The disease first developed after the receipt of an injury to the joint from a severe kick. The joint became acutely inflamed, and he was energetically treated by leeching, local applications, and rest in bed. The attack was attended with some constitutional disturbance, and, at the end of six or eight weeks, he was able to go out, but the joint remained

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Case I.—Fig. 1.

EXCISION OF THE KNEE JOINT.

Operation performed 17th May, 1865.
Photograph taken 20th October, 1865, five months after the operation.

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Case I.—Fig. 2.

EXCISION OF THE KNEE JOINT.

Photograph taken 5th December, 1870, five years after the operation.

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stiff and enlarged; he was able, however, to get about, but could not join in play with boys of his age, as the slightest blow or twist would light up fresh inflammatory action, necessitating rest for days or weeks. Two years before he came under my observation he began to experience pain in the joint at night, and would suffer from severe startings, which occasioned much agony and interfered with his rest. At the time of his admission into the Montreal General Hospital he presented a care-worn appearance; there was loss of appetite, he was pale and anxious, and the affected limb presented a marked contrast to its fellow. The muscles of the affected leg were flabby and wasted, and the joint was by measurement an inch and a half larger than the other knee. On careful examination the condyles of the femur appeared to be expanded, there was evident pulpy thickening of the synovial membrane, and on motion, rotatory or lateral, of the joint, or on moving the patella, distinct roughness was found to exist. I have thus given a general view of the clinical features observed in this characteristic case, one by no means uncommon. In ten weeks after the operation all discharge had ceased, the bones were firmly united, the limb was supported by a gutta-percha back splint, and the patient was going about the ward on crutches. He rapidly gained strength, and, at the end of the fifth month, he could walk about the street with the aid of a stick. The photograph from which the engraving marked Fig. 1 is copied, was taken five months after the operation, and the patient walked down to the photographic gallery and returned, which was something over a mile from the Hospital.

Figure 2 is from a photograph of this man taken in 1870—or five years after his recovery—it will be noticed that the growth of the leg operated upon has been quite equal to that of its fellow, the muscular development of the calf is remarkable. The man has grown in stature some two inches, and the leg has grown in length in proportion to its fellow. There was one inch and three quarters of shortening after recovery from the operation, and the same amount of shortening was found to exist at the last examination made in 1870.

Case II.— This case was somewhat different in the character of the disease present, and in its mode of attack. The patient was a healthy, robust, well-developed man of 22 years of age. Nine years previously he had suffered from acute articular rheumatism, and, after three months' confinement to bed, he was able

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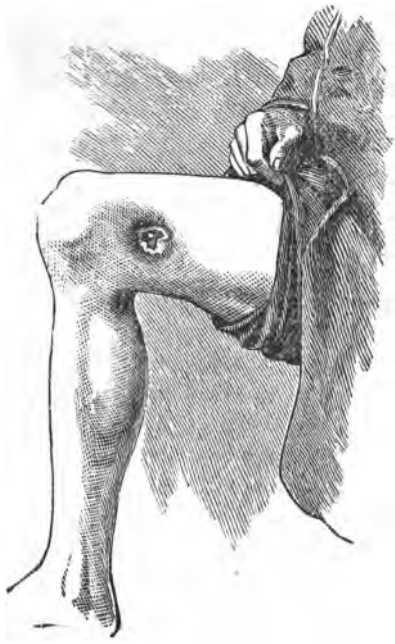
to get about, but the disease appeared to have located itself in the right knee joint, which remained very stiff, swollen and painful. At the time he came under my observation the right knee joint was partially anchylosed, the limb was bent at a right angle, and the patella was fixed, being attached by bony union to the outer condyle of the femur. At the inner side of the thigh, close to the



joint, there existed a sinus which led downwards to denuded bone, and on the outer side of the thigh there were the remains of the cicatrices, through which several pieces of bone had come away at different times. The operation of excision was performed on the 21st June, 1866, and about two inches of bone removed. All discharge had ceased on the 9th August, and firm union was found to exist. The limb was put up with a glue bandage, and the patient allowed to leave his bed; he rapidly gained strength, although I did not permit him to leave the Hospital for some weeks.

Figure 3 is from a photograph which was taken in December of that year. The patient at that time could walk without the aid of a stick.

Case III.—This was very similar in origin and general history the one just related. It occurred in the person of a young

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Case II.—Fig. 3.

EXCISION OF THE KNEE JOINT.

Operation performed 21st June, 1866.
Photograph taken January, 1867, seven months after.

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man, 23 years of age, not over robust, and whose history was as follows. At the age of 11 years he was attacked with acute synovitis, which had apparently followed a lengthened exposure to cold, as he had the previous day remained in the water bathing for several hours. When he came under my observation I found the leg flexed at right angles to the thigh. The bones of the leg were dislocated backwards, the condyles of the femur projected, and the patella was firmly attached to the external condyle. The whole limb presented a dwarfed appearance, and there was found to be shortening in the length of the thigh of two inches, and of the leg of one inch. The foot was very much arched, which gave to the heel a peculiar prominence, and the toes were semi-flexed. He could not use his leg in walking, his gait was very awkward, and to himself very wearisome, as he was forced to use a stout stick. There were no sinuses, nor had the joint been opened. Here was a case in which some surgeons would have practised subcutaneous division of the ham string muscles, and *brisement force*. I believe from the condition in which the bones were found subsequently that such an operation would have been attended with disaster and loss of the limb.

Excision of the joint, however, was advised, and the operation performed on the 28th May, 1870. The ham string muscles had to be divided before the bones could be brought into position, unless indeed an extra slice of bone had been removed; this I was desirous of avoiding on account of the already shortened state of the limb.

The bones when examined presented the following appearance. There existed caries of the head of the tibia and also of the extremity of the femur, the inter-articular fibro-cartilages were gone, the patella displaced outwards and firmly attached by bone to the external condyle of the femur. The case progressed slowly, as suppuration and burrowing of pus gave much trouble and constant employment, slitting up sinuses and using drainage tubes. The poor fellow sometimes became wearied, and requested that amputation should be performed. This, however, was not acceded to, and on the 14th November the report states: "He has been going out for a walk for the last ten days, and with a crutch and stick gets along very well. It was found that from the arching of the foot and the flexed state of the toes that he sustained his weight on the point of the heel and ends of the toes. To remedy this state I divided the plantar fascia and short flexor subcutaneously and straightened

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the foot. This enabled him to bring the foot well down, and gave greater freedom to the motions of the foot. He left the Hospital some time in the month of February following, at which time he was able to use the leg freely. There was shortening to over four inches, which was made up by an addition to his boot. General health good. I have heard from this man once since he left Montreal and he stated that he was progressing favourably.

Fig. 4 is from a photograph taken in February, 1871, and gives a fair idea of the condition of this patient at that time.

Case IV.—This was in a boy aged 14 years. He had been a sufferer from a bad knee since his fourth year. He was admitted into the Montreal General Hospital in October, 1870. The leg on examination was found semi-flexed, it was exquisitely tender, he would cry out with agony or fear if even the bed was touched. He presented an anxious and care-worn appearance. The knee was very much larger than its fellow, and when handled gave great pain which persisted for hours. There was effusion into the subcrural pouch, and his sleep was disturbed by frequent startings. Under chloroform the limb was placed in an extended position on a gutter splint, and while under the influence of the anæsthetic I examined the joint, when it was found that there was much thickening of the tissues around the joint and marked roughness, as though from erosion of the cartilages, between the ends of the bones as well as on the under surface of the patella. The treatment was chiefly palliative: absolute rest, good nourishment and locally hot fomentations over the joint. Morphia was given hypodermically, which secured refreshing sleep. By these means the acute inflammatory symptoms gradually subsided. Subsequently I tapped the joint at the inner side of the thigh with a small aspirator needle, and drew off a quantity of serous fluid tinged with blood. This gave him considerable relief and the startings subsided. Relief, however, was only temporary, and a fresh attack of acute inflammation followed, which was relieved as before. As soon as he was in a favourable condition, I recommended excision of the joint, which operation was performed on the 21st December, 1870. As the patient was a growing lad I determined to save as much of the epiphyses as possible, and with this end in view I adjusted to Mr. Butcher's frame a carpenter's whip saw, somewhat coarser than those used for fret-work. A semicircular sweep of the saw was applied to the end of the femur, thereby removing all the diseased bone so that the extremity of the femur after removal of the condyles presented a convexity. The head of the tibia

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Case III.—Fig. 4.

EXCISION OF THE KNEE JOINT.

Operation performed 26th May, 1870.
Photograph taken February, 1871.

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was next attended to and the surface was removed, rendering it concave. The patella was then removed, as its surface was found diseased. The leg was bandaged in the usual way and placed in a gutter splint with a vacancy on either side opposite the joint, the popliteal space being supported by a connecting shelf After adjustment of the bones the flaps of the wound were brought together by interrupted metallic sutures. The shock after the operation was very marked, his pulse, which was weak, ranged from 160 to 180 per minute. His condition, however, improved, and at the end of a week suppuration and granulation of the wound progressed slowly, but he took nourishment well. The advantages in this method of section of the bones are two-fold. In the first place the smallest quantity of bone is removed, portions of the epiphyses are left, which to a growing individual is a great gain, and secures the after-growth of the limb; and, secondly, a larger extent of surface is secured, and from the shape of the cut surfaces there is less risk of displacement of the bones and forcing forwards of the end of the femur from contraction of the ham-string muscles unopposed by the quadriceps extensor which had been divided. In all the cases reported the bones were with difficulty retained in position. In all there was a tendency (in the thigh bone) to rise out of position. The accompanying woodcut is an accurate representation of the portions of bones removed.

The case progressed favourably at first, though the progress was very slow. The wound in the soft tissues closed with the exception of two or three points, sinuses, which led down to bare bone. At the end of six weeks he had a severe rigor, and symptoms of osteomyelitis set in, for which amputation was proposed, as his general health was failing and the discharge was considerable. His friends, however, refused to permit amputation, and determined to remove him to his home in the country. This was some time in the following March, and he left the Hospital. Since then I have lost all trace of this case, but have heard that the boy recovered with a useful leg. However, I have no positive evidence to offer on this head, and therefore record the result as doubtful.

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Case V.—This was a case of bony anchylosis at a right angle of the knee joint, which was admitted under the care of my colleague, Dr. Wright. For the relief of this deformity Barton's operation was proposed, but it was found necessary to remove the entire mass of what had been the knee joint. This was rendered necessary in consequence of the contraction of the muscles. The case progressed favourably and the patient made a good recovery with a useful limb.

Case VI.— Under the care of Dr. MacCallum was operated on a month or two after the one just reported. It was in an adult æt. 42. The patient progressed favourably for the first few weeks, the soft parts united and all discharge had ceased, but bony union was not secured. The limb was put up in a permanent apparatus, and he was allowed to go about on crutches. Subsequently the wound opened at several points. The man was desirous of having amputation performed, as time was to him an object, so that his wishes were complied with. The limb was removed and he made a good recovery. The bones were found in excellent position, but no attempt at bony union had occurred. It was in my opinion a case in which re-excision would in all likelihood have succeeded. A somewhat similar instance is recorded by Sir William Fergusson, in which that surgeon performed re-excision and secured a good result.

Case VII.—This was in a man aged 36, who had suffered for years from chronic synovitis resulting from injury, with ultimate disorganization of the joint and perfect inability to use his limb. He came from the country, and was brought to the Hospital for the purpose of having his limb amputated. His health was not seriously impaired, he was strong, robust and well nourished. Excision was performed 20 September, 1872, and everything progressed favourably for the first eight weeks, partial union had taken place, when unfortunately the poor fellow contracted small-pox, and he was removed to the small-pox department. He recovered from the attack, but when returned to me, I found the bones were lying in a huge collection of pus. Whatever union had existed before, there was certainly none at this period, so that I did what was deemed necessary, drained off the pus, built up his general health, and subsequently amputated the limb. He made a good recovery and left the Hospital.

Case VIII.—S. C., aged 23, had suffered for the past four years from a sore knee. Had always enjoyed good health up to the summer of 1868. She was a nervous, hysterical girl, rather delicate in appear-

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ance, with florid complexion, blue eyes and fair hair. Her digestive organs were in good order, and she was regular. The attack appeared to come on from some over-exertion or twist of the joint while walking. This was in the summer of 1868. The knee gave her much pain, more especially at night, which deprived her of rest. There was swelling of the joint, and it was tender to the touch or in bending it. She was admitted to the Hospital in February, 1869, and was then treated for hysterical knee joint. Relief was given, and she was discharged, but again returned in a few months. On this occasion the joint was by measurement found larger than the other. There was considerable pulpy thickening of the tissues, and various means were resorted to for her relief, such as leeching, blistering, hot stupes, and putting the leg up with Scott's dressing Towards the close of 1871 she was again admitted to the Hospital. and remained under treatment, but no permanent relief was given, In October, 1872, she suffered from night startings,the knee was exceedingly tender, and measurements showed the affected joint an inch larger than its fellow. Examination under chloroform revealed distinct roughness, and in consultation it was deemed advisable to excise the joint. The operation was performed on the 11th October, 1872. Erosion of the cartilages existed, and was tolerably extensive. About an inch and a half of the femur was removed, and a very thin slice of the head of the tibia. The bones, after the application of the saw, were found tolerably healthy. The patella was removed, as its free surface was implicated in the disease. The limb was placed on a padded posterior iron splint, being carefully bandaged from the foot to within half an inch of the lower margin of the wound. The thigh was secured to the upper part of the splint by straps well padded. The bones being accurately adjusted, the wound in the soft tissues was closed, and a lotion of carbolic acid applied with lint and oil silk. On the sixth day the patient was comfortable, temperature normal, and slight discharge from the edges of the flap. The wound in front was well united, and several stitches were removed. The first removal of the splint was effected on the 9th November, when it was found that the wound had almost entirely closed—leg washed, and again adjusted in the splint.

December 1st.—The leg again taken down. A small portion of the wound was discharging at the inner side, but firm bony union was found to exist. The splint was, however, re-applied, and the leg retained in the same position up to the 17th December,

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when it was entirely removed, and the limb, supported by sand bags placed on either side, was laid on a soft pillow. The following day it was noticed that the limb was slightly swollen, so that a bandage was applied from the toes up to the groin. The bandage was removed each day and gentle friction practiced, when the limb was again bandaged. On January 2nd, 1873, or twelve weeks from the date of the operation, she walked the full length of the ward supported by two persons, one on each side. From this time she progressed rapidly, and soon acquired sufficient confidence to walk with crutches. The photograph from which the engraving Fig. 5 is made was taken on the 20th March, 1873, and she walked unassisted into the photograph gallery from the vehicle which brought her from the Hospital. By the most accurate measurement the amount of shortening in this case was found to be one inch and a half. This patient was discharged from the Hospital in April at which time she could walk with tolerable freedom. Her friends sent her to the country during the summer months, and the following October she returned to her family in Ireland. Shortly before leaving this country I examined the leg, and found it straight, well proportioned, the muscles of the leg and thigh being firm and well developed. She could sustain any amount of exercise, and walked with perfect freedom of motion.

Case IX.—I am indebted to my friend Dr. Drake for the particulars in this case and permission to include them in the series.

J. G., aged 22, came under the care of Dr. Drake, Sept. 15th, 1873, suffering from painful swelling in the right knee joint. The joint had been repeatedly injured by sprains, falls, &c., and for the past two years had been more or less swelled and painful. For the past three weeks the pain has been excessive, and he uses large quantities of morphia to alleviate it. Rest and palliative measures were resorted to till October 15th, when, the patient being fully etherized, the joint was excised. The semilunar incision was adopted, the patella removed, together with about 2 inches of the lower end of the femur, and ½ an inch of the tibia. The cartilages of both surfaces were considerably eroded, and the synovial membranes much thickened. The limb was put up firmly in a straight trough splint, attached by rivets to a pelvic belt made of wire and covered with leather, moulded carefully to the shape of the patient's body. The limb remained undisturbed for 73 days, was then dressed, and returned to the splint for 20 days. At this time, owing to a defect

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Case VIII.—Fig. 5.

EXCISION OF THE KNEE JOINT.

Operation performed 11th October, 1872.
Photograph taken 20th March, 1873.

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in the splint, a superficial sore of some three inches in length was observed on the outer side of the thigh. The splint was removed altogether, and the limb steadied by means of sand bags. He remained in bed 43 days longer, and was then allowed to sit up, union being apparently complete. He left the hospital in March, 1873, with two or three small fistulous openings in the neighbourhood of the wound, which did not close completely for four or five months. Nevertheless, he was able to get about with the aid of a crutch, and came repeatedly to my office. It is worth recording that, on the evening of the day on which the operation was performed, a considerable hemorrhage occurred from the bowels, and this continued for three consecutive days and nights. The urine also was smoky, and contained albumen in considerable quantity. The albuminuria continued for upwards of twelve months, and was present when I last examined the urine, fifteen months after the operation. The limb is now (Jan., 1875) perfectly strong, the wound and fistulæ completely healed, shortening to 2½ inches. He expresses himself perfectly satisfied with the result, and says he walks as well as ever he did without a cane or support of any kind.

Case X. R. E., aged 20, was admitted into hospital in April, 1875, suffering from an attack of acute synovitis. The history is as follows: In October, 1871, he slipped while running, fell, and struck his knee a severe blow. The leg became swollen and painful; the pain, however, was not sufficient to oblige him to keep in the house, so that he continued to walk about. He experienced a sense of fatigue and also a creaking sensation in the joint while walking,—this sense of uneasiness obliged him to sit in the house after returning from school. Towards the end of the month of October he consulted Dr. Roger, who enjoined absolute rest, put the leg on a splint, and painted the knee with tincture of iodine. The leg was also blistered several times, which gave him relief. In February, 1872, he left Montreal and returned to his home in St. John's, P. Q., when he became the patient of Dr. Wight of that place. The same treatment of rest was followed out, and, at the end of a week or two, belladonna plaster spread on leather strapping, and a bandage, were applied over the knee. While under treatment an abscess formed, which was freely opened, and discharged for some five or six weeks. After the closure of this abscess he noticed that motion in the joint was less free, still he was able to go about with comparative comfort. In March, 1873, he again slipped while running, and twisted or sprained his

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knee; this accident obliged him to keep his bed for six weeks. After recovery from this injury freedom of motion was much the same as before. Again in April, 1875, he met with a severe fall, and shortly afterwards, on the 29th April, he was admitted into the hospital. The leg was put up on a McIntyre's splint, and as he was somewhat run down tonics were given. Towards the middle of May an abscess was found to exist in the vicinity of the joint, this was freely opened and a drainage tube inserted. Subsequently pus formed at other points, both above and below the joint; these were treated in the usual way, free openings being made, and the boy was given nutritious diet, and ale, the quinine and iron mixture on which he had been placed being continued.

The patient came under my charge on the 1st July, 1875, and I found the joint open and sinuses leading to bare bone at the extremity of the femur. The boy was in a very unsatisfactory condition; however, I proposed excision and, if the disease was too extensive, determined to proceed to amputation at the lower third; this was agreed to, and the operation performed on the 13th July, 1875. At the end of eight weeks union between the bones was tolerably firm. There were one or two points still discharging a small quantity of pus, in fact, the amount of the discharge was so trifling that it did not more than moisten a piece of lint in the twenty-four hours. The rest of the wound was firmly united. As the patient was anxious to leave his bed a back splint of gutta percha was moulded to the limb, and it was put up in a glue bandage, openings being made in the bandage opposite the points still discharging for the purpose of changing the dressings, and he was allowed to get up and go about on crutches. He gradually acquired confidence in the strength of his limb, and, by the middle of January, could limp about with a stick. He returned home on the 2nd February, 1876. The following October he again presented himself for admission to the hospital, as there existed a somewhat indolent ulcer, five inches in length, situated on the outer side of the thigh, which had been treated with red wash and a bandage, but without much benefit. Simple water-dressing was at first employed, and cod liver oil with tonics and good diet. This had the effect of improving the character of the sore, when it rapidly healed by skin grafting. At this time the patient could walk without a stick, and stated that he felt perfectly secure on that leg. At the present time he is able to walk any reasonable distance without fatigue; the shortening is about 2 inches. This

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Case X.—Fig. 6.

EXCISION OF THE KNEE JOINT.

Operation performed 13th July, 1875.
Photograph taken June, 1877.

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patient was in the room at the time of the reading of this paper, and his leg was examined by the members of the association present. The appearance of the leg in this case is well shown in Fig. 6.

Case XI.—M. McG., a delicate looking girl, æt. 12 years, was admitted into hospital on 15th July, 1875, with disease of the right knee joint of several years' duration. The joint was flexed at a right angle with the thigh; there was dislocation backwards of the bones of the leg from contraction of the ham-string muscles. There were sinuses communicating with the joint which led into its cavity and reached bare bone. The muscles of the leg and thigh were very much wasted, soft and flabby, and the joint itself was tender, so that she would not permit examination, except while under chloroform. Excision was performed on the 10th August, 1875. In order to secure the after-growth of the bones the entire epiphyses were not removed from either the femur or tibia. The end of the femur was rounded off, making it convex, and the end of the tibia was treated the reverse of this, rendering it concave. There was much difficulty in straightening the leg in consequence of contraction of the muscles, so that, in order to prevent crushing of the ends of the bones, a second thin slice had to be removed from the end of the femur and the ham-string tendons had to be divided; the bones then came into position, but the tissues in the popliteal space appeared to be put on the stretch, this, in all likelihood, led to after difficulty in the management of the case, probably from stretching of the popliteal nerve. There was, throughout, great tendency to the formation of sloughs from pressure, so that, after the end of the first ten days, the splint had to be removed and the parts retained in position by means of a weight keeping up extension, and sand bags placed on either side of the limb; sloughs formed over the tibia, on the dorsum of the foot, and over the heel. The patient complained of a sense of tingling in the leg, but of no urgent pain. She progressed slowly, the sloughs separated, and healthy granulation followed with closure of the sores. The wound, the result of the operation, took on healthy action, and almost entirely closed, and, at the expiration of the fourth month, she was allowed to leave her bed and go about on crutches; bony union, however, was not complete, as, owing to the difficulty of retaining the parts at rest, some motion, though limited, existed. There was still slight discharge from the wound, but the patient was improving in general health. The following June she left the hospital, and returned to her friends. At this time she walked about on crutches

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and was tolerably active. This patient was seen again in August 1877, when the following condition was found: Her general health was very good; union of the bones was firm; all discharge had ceased; the leg was slightly bent, and she could sustain the weight of the body on the leg; muscular development was markedly in abeyance, apparently because the little girl was disinclined to use the limb, and she was very active on crutches. The limb was by measurement two inches shorter than its fellow.

Case XII.—J. B., æt. 38, farmer, was admitted into hospital April 5th, 1877, with chronic disease of left knee-joint. Family history good. No history of tubercular, scrofulous,or rheumatic taint, up to commencement of present affection. Seven years ago enjoyed perfect health. At that time after working in cold water, the left knee became swelled and painful, particularly at night. The swelling was evidently synovial. Was not confined to bed, but has gone about ever since that time, though somewhat lame. At times after any slight injury the joint would become more painful. It was more swollen than it is now. Since last spring he has been unable to walk without crutches. He has had starting pains in the joint at night for the last year, and the same pain was produced by any jarring of the joint. There is great thickening about the joint. Circumference of the leg over the middle of the patella is 14½ inches, of the sound knee 13½. The patella is fixed. There is very little motion of the joint possible. The limb cannot be straightened entirely, and scarcely flexed beyond its constant position. By flexion a grating sensation can be got. There is no pain when the joint is at rest. The muscles of the thigh are much wasted. The patient's general condition is good. No disease can be detected in any of the organs. Urine is clear and of normal appearance, acid in reaction sp. gr. 1020. No albumen or sugar. Excision of the joint was performed by Dr. Fenwick on April 11th. The limb was put up on a gutter splint moulded around the buttock so as to fix the pelvis as much as possible. A drainage tube was put through the wound. The incision healed by the first intention. The stitches were removed on the 9th day. There was a moderate degree of inflammatory fever with a rapid pulse, ranging from 108 to 124 till the 15th day, when the temperature became normal and the pulse 92. The temperature remained normal for three days, when after a chill it ran up to 102°. After this till the 1st of June there were fluctuations from high to low temperatures with occasional chills, and a

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good deal of sweating. During this time there was evidence of much cellular inflammation around the joint, with the formation of some collections of pus. June 9th, the splint was removed and there was found to be tolerably firm union of the bones. A moulded leather back splint was applied with a narrow piece of wood at the back to strengthen it. Patient's condition now rapidly improved. June 20th.—Patient got out of bed on a wheeled chair, and in a few days he began to go about on crutches. At this time his temperature would run up in the evenings to 100° and even 102°. July 20th—The leather splint was removed. Union now is quite firm. The wound is still open at the two angles of the incision. The discharge is very slight. The shape of the leg is good. The patient was discharged August, 1877, went to the country, being instructed to return when the wound had altogether ceased discharging. He can now bear a considerable weight on the limb, and goes about well on his crutches. He was thus four months in hospital after the operation. Since this report I heard from the patient, and he informed me that he was progressing fairly well, was able to get about, but lacks confidence, as he is always fearful of injury resulting from extra exertion or from falling down.

Case XIII.—F. P., æt. 17, a farmer's son, was admitted into the Montreal General Hospital on July 5th, 1877, with a chronic disease of the right knee. There is a history of scrofula on the father's side of the family. Patient says he was perfectly healthy until two years ago. At that time a swelling began in the right knee, which increased and diminished alternately, and was unattended by pain for about a year. He felt only a stiffness and numbness of the joint. He attributes the affection to overwork, especially mowing hay. About a year after the first appearance of these symptoms pain began to be felt, not very severe at first, without any increase in the swelling, until last Christmas. He could walk without much lameness. The pain and consequent lameness increased till in April he began to use crutches. Since then the knee has become fixed in a flexed position.

The measurements of the diseased joint as compared with the other are as follows:

Right Leg.		Left Leg.
Over the patella	15¾ in.	14¼ in.
4 in. above "	15½ "	14 "
4 " below "	15 "	12¼ "

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There is much heat and tenderness about the joint. It is red and bulging on the inner side near the border of the patella. Fluctuation here is evident. There is partial anchylosis of the right elbow. He cannot extend the forearm completely. There is no displacement of the bones; some swelling and slight tenderness between the olecranon and external condyle. This condition began a year ago. Has felt neuralgic pains at times darting through the joint, and suffered from sciatica at the same time. The patient is a good deal emaciated. Appetite is good. Heart, lungs, and liver are normal. Examination of urine gives a negative result.

July 7th.—Excision performed. Much pulpy degeneration of the joint, not much pus. Spots of ulcerated cartilage on both condyles of femur. Considerable degeneration of the inter-condyloid notch. The semilunar cartilages of the tibia were entirely destroyed, and several diseased spots were found on both articular surfaces of the tibia. The excision produces shortening of the limb by about 1½ inches. The limb was put up on a gutter splint, cut out at the knee, and extending up the side so as to fix the pelvis.

July 11th.—Patient feels comfortable. Wound looks clear and healthy. Urine and other excretions normal. Appetite poor. Tongue heavily coated. Vomits occasionally. Bed sores appearing over the sacrum.

July 21st.—Removed stitches, wound looking well, united superficially, drainage tube still in. There are frequent spasms of the flexors of the thigh which cause great pain. General condition seems to be improving. No night sweats. Tongue clear. Pulse 132, temperature 100⅕°. Sleeps well after morph. gr. ¼ hypodermically. Appetite very good.

July 25th.—Temperature last night 104°. Ordered quin. grs. xv. Morning temperature 98°. Passed a good night. Gets M. grs. ¼ hypodermically night and morning. Pulse 124, it has been very rapid throughout. Knee dressed once a day, and lightly bandaged with a many tailed bandage.

July 29th.—Diarrhœa for last two days. Increase stimulant, brandy 6 ounces. Ordered pill plumbi c opio. Tongue dry. Large slough over sacrum.

July 30th.—Diarrhœa persists. Lost appetite. Tongue dry. Pulv-kino. co. and starch and opium enemata given. Patient getting very weak. Some dusky red blotches on back of left forearm and

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one over styloid process of right ulna. Diet of boiled milk. Patient sweats considerably, no chills.

July 31st.—A large collection of pus on outside of leg below the knee was discovered and opened. The pus was very fetid. Introduced a drainage tube. Ordered frequent syringing of opening with carbolic lotion. Discharge from wound of operation scanty.

Aug. 1st.—Bowels moved five times during night. Slept pretty well, did not sweat. Pulse 120, temperature 98½°. Tongue moister. Ordered a mixture of ac. sulph. co., spt. chloroform, and decoc. hæmatox. Red blushes on left forearm disappeared.

Aug. 3rd.—Diarrhœa less, slept well. Tongue clean and moist. Wound improved in appearance, discharge more healthy looking and more copious. No sweating. Pulse 128, temperature 98⅖° in morning.

Aug. 5th.—Pulse 124, temperature 99⅕°. Diarrhœa continues. A blush with œdema on forehead. Felt chilly yesterday. Patient very weak. Tongue clean but glazed.

Aug. 6th.—Patient continued to get weaker and died at 9 p.m. No autopsy was allowed, but the leg was examined. There was found to be no union between the bones. There was a collection of unhealthy pus around the lower end of the femur, which was partly stripped of periosteum and necrosed superficially.

I am indebted to the reports of cases Nos. XI. and XIII. to the late Dr. J. D. Cline, who was my House Surgeon during the period that they were under observation. Case XIII. is from the record taken at the time by the Clinical Clerk, Mr. D. F. Smith, and is very carefully and accurately reported.

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No. Name and Age.	Condition of Joint.	Date of operation.	RESULT.			Amount of shortening.	No. of days in bed.	Operator.
			Cured.	Amputat'd	Died.			
1. J. K. Aged 18.	Chronic disease of left knee joint from injury, 7 years' duration.....	17 May, 1865	1	.....	.....	1¾ inch.....	70 days	Dr. Fenwick.
2. J. D. Aged 22.	Chronic disease from rheumatic inflammation of right knee joint, partial anchylosis, 9 years' standing.....	21 June, 1866	1	.....	.....	2 inches	56 days.....	Dr. Fenwick.
3. W. H. Aged 23.	Partial anchylosis in bent position, 9 years' duration. Arrest of growth of bones in length.....	23 May, 1870	1	.....	.....	4½ inches.....	154 days.....	Dr. Fenwick.
4. J. McK. Boy aged 14.	Chronic disease of 10 years' standing.....	24 Dec., 1870	Doubtful		.....	2 inches.....	Patient taken to the country by his friends; result not hopeful	Dr. Fenwick.
5. Boy aged 16.	Complete anchylosis at a right angle.....	.....	1	.....	.....	3 inches.....	125 days.....	Dr. Wright.
6. Man aged 42..	Chronic disease of long standing	.....	.....	1	.....	.....	No union of bones in this case, the patient insisted on having the leg amputated.....	Dr. MacCallum.

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7. F. K. Aged 36.	Chronic disease, result of injury, starting pains at night, unable to use the limb; several years' duration.....	20 Sept., 1872	.....	1	.....	Partial union of bones. Contracted Small Pox, Extensive suppuration, necessitating amputation..	.....	Dr. Fenwick.
8. S. C. Girl aged 21.	Disease of left knee joint of five years' duration..	11 Oct., 1872	1	.....	.....	1½ inch	84 days.....	Dr. Fenwick.
9. F. D. Aged 22.	Chronic disease of knee joint.....	16 Oct., 1873	1	.....	.....	2½ inches.....	136 days.....	Dr. Drake.
10. R. E. Aged 19.	Chronic disease of right knee joint.....	13 July, 1875	1	.....	.....	2 inches.....	56 days.....	Dr. Fenwick.
11. Mary McG. Aged 12.	Chronic disease with backward dislocation of bones of leg, partial anchylosis in bent position.....	10 August, 1875	1	.....	.....	3 inches.....	212 days.....	Dr. Fenwick.
12. J. B. Aged 38.	Chronic disease of knee joint, result of injury...	11 April, 1877	1	.....	.....	2 inches.....	98 days.....	Dr. Fenwick.
13. F. P. Boy aged 17.	Chronic disease of joint implicating bones.....	7 July, 1877	.....	.....	1	Died from Pyæmia...	30 days.....	Dr. Fenwick.

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COTÉ, JOSEPH	St. Vallieres, Q	
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COVERNTON	Hamilton, O	1877
COWIE, A. J	Halifax	1877
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CUMMING, W. H	Toronto	1869
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DANIEL, J. W	St. John	1873
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GAUTHIER, SERAPHIN.	Montreal	1867
GAUVREAU, E.	Quebec.	1870
GERKIE, W. B.	Toronto	
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GODFREY, R. T.	Montreal	1868
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GORDON, H. A.	Brockville, O.	1869
GRAHAM, J. E.	Toronto	1876
GRANT, J. A.	Ottawa	1868
GREENLESS, A.	Toronto	1876
GREGORY, J. A.	Fredericton, N.B.	1873
GROVE, J. T.	St. Andrews, Q.	1873
HAGEL, S. D.	Toronto	1876
HALL, C. B.	Toronto	1869
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HAMILTON, C. C.	Cornwallis, N.B.	1870
HAMILTON, G. A.	St. John, N. B.	1867
HAMILTON, R.	Sutton, Q.	1867
HANON.	Mitchel	1869
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HILL, H	Ottawa	1870
HILLARY, R. W	Aurora, O	1867
HENDERSON, A. A	Ottawa	1870
HINGSTON, W. H	Montreal	1867
HODDER, ED. M	Toronto	1867
HODDER, FREDERICK		1876
HOLMES	Brussels, O	1876
HOPE, W	Belleville, O	1869
HORNIBROOK	Mitchell, O	
HOWARD, R. P	Montreal	1867
HOWLAND, F. L	Woodstock, O	1876
HYDE, J	Stratford, O	1869
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INCHES, C	St. John	1873
INCHES, R. R	St. John	1873
JACKSON, ALF	Quebec	1867
JACKSON, J. P	Stratford, O	1869
JACQUES, NAP	St. Hyacinthe, Q	1868
JOHNSON, A. H	Portsmouth, N. B	1868
JOHNSON, C	St. John, N.B	1868
JOHNSON, A. J	Yorkville, O	1877
JORDAN, F. G	St. John	1873
KENNEDY, R. A	Montreal	1877
KENNEDY, J. A	Toronto	1876
KERR, J	Londonderry, N. S	1875
KINCAID, R	Peterboro, O	1869
KING, J	Toronto	1876
KOLMYER, A. H	Montreal	1877
LACHAINE, A	Levis, Q	1867
LACHAPELLE, E. P	Montreal	1871
LACHAPELLE, S	Montreal	1877
LACOMBE, C	Saguenay, Q	1869
LAFONTAINE, C	Berthier en Haut, Q	1867
LAMARCHE, A	Montreal	1877
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LAROCQUE, G	Longueuil, Q	1868
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LARUE, F. H. A	Quebec	1867
LARUE, G. A	Quebec	1871
LARUE, L	Quebec	1871
LARUE, PRAXEDE	St. Augustin, Q	1867
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LAVOIE, NAPOLÉON	L'Islet, Q	1867

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LEBEL, C. O.	St. Gervais, Q.	1867
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LEGGO, C.	Ottawa	1870
LEMIEUX, C. E.	Quebec	1867
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LEPAILLEUR, L. A.	Chateauguay, Q.	1867
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LEVI, R.	Inverness, Q.	1877
LINDSAY, E.	Carouge	1867
LUNSON	Halifax	1875
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McCONNELL, J. B.	Montreal	1877
McDONALD, A. A.	Guelph, O.	1876
McDONALD, M. P.	Cambridge	1873
McDONALD, W.	Montreal	1877
McDONNELL, R. L.	Montreal	1868
McDONNELL, RICHARD L.	Montreal	1877
McFARLANE, L.	Toronto	1869
McFEE	Caledonia, O.	1870
MacCARG		
MacGILL, W.	Oshawa, O.	1869
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MacLAREN, L.	Mitchel	1869
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MacPHERSON, F. W.	Oromocto	1873
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MACKAY, H.	Woodstock., O	1874
MALLOCH, A.	Hamilton, O.	1874
MALLOCH, W. B.	Moose Factory	1868
MARKELL, R.	Aultsville, Q.	1868
MARMETTE, J.	Montmagny, Q.	1867
MARSDEN, W.	Quebec	1867
MARTIN, VINCENT.	Chicoutimi. O	1867
MARTYN, DEWITT.	Kincardine, O	1868
MASSON, G. A.	Laprairie, Q	1868
MAY, S. P.	Toronto	1869
METCALF, W.	Toronto	1876
MICHAUD, A. T.	Kamouraska, Q.	1867
MIGNAULT, A.	St. François Montmagny, Q.	1868
MILLET, G. D.	Lanoraie, Berthier, Q.	1867
MOLSON, W.	Montreal	1877
MOORE, C. Y.	Brampton, O.	1876

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MORAN, A.	Halifax	1868
MORE, J. R.	Hopewell, O.	1873
MORIN, C.	St. Nicholas, Q.	1867
MORSE, C. J.	Montreal	1877
MORTON, G. T.	Bradford, O	1869
MOSTYN, W.	Almonte, O.	1870
MOUNT, G. W.	Montreal	1867
MOUNT, P. E.	Montreal	1867
MUIR, H. S.	Halifax, N.S.	1867
MULLIN, J.	Hamilton	1874
MUNRO, P.	Montreal, Q.	1867
MUNRO, C. H	Picton, O.	1867
NELSON, HUBERT	Quebec	1871
NELSON, W.	Montreal	1873
OGDEN, W. W.	Toronto	1869
OGDEN, U.	Toronto	1869
OLDRIGHT, W.	Toronto	1868
O'LEARY, P.	Montreal	1868
OLIVER A. S.	Kingston, O.	1869
ORONHYATEKHA	Frankfort, O.	1869
OSLER, W.	Montreal	1876
PACQUET, A. H.	St. Cuthbert, Q.	1867
PAINCHAUD, C. F.	Varennes, Q.	1867
PALLARDY, F. S.	Verchères, Q.	1867
PALMER, R.	Riverside, Hopewell, O.	1867
PARÉ, F.	Sherbrooke, Q.	1868
PARK, G. A.	Montreal	1877
PARKE, C. S.	Quebec	1877
PARKER, HON. D. McNEIL	Halifax	1867
PATTUELO, A.	Brampton, O.	1869
PELTIER, HECTOR	Montreal	1867
PEPPARD	Great Village	1875
PERRAULT, F. X.	Longue Pointe, Q.	1867
PERRIGO, J.	Montreal	1877
PHILP W.	Waterdown, O.	1876
PHILLIPS, T. G.	Grahamville, O.	1869
PICAULT, C.	Montreal	1868
PICKUP, J. W.	Beauport, Q.	1867
PLAYTER, E.	Toronto	1876
POISSON, N. M.	Arthabaska, Q.	1867
POLLARD, S. B.	Toronto	1876
POLLOCK, D. J.	Scarborough, O.	1869
POTTS, J. G.	Belleville, O.	1868
POULIN, L. Z.	St. Hubert, Q.	1867
PROUDFOOT, A.	Montreal	1877
PROULX, J. P.	St. Marie de Beauce, Q.	1871
PROVOST, P.	Memramcook, N.B.	1867
PYNE, T.	Toronto	1876

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REDDY, J.	Montreal	1868
REED, J.		1869
REEVE, R. A.	Toronto	1869
REID, A. P.	Halifax	1869
RICARD, A.	Montreal	1868
RICHARDSON, J. R.	Quebec	1868
RICHARDSON, JAS. H.	Toronto	1867
RIDDEL, A. A.	Toronto	1869
RIDLEY, H. T.	Hamilton	
RINFRET, F. R.	Quebec	1867
ROBERTSON, D.	Milton, O.	1876
ROBERTSON, H.	Toronto	1876
ROBILLARD, E.	Montreal	1867
ROBINSON, C.	Claude, O	1867
ROBITAILLE, J.	Quebec	1868
ROBITAILLE, A.	Quebec	1867
RODDICK, T. G.	Montreal	1867
ROSEBRUGH, A. M.	Toronto	1867
ROSEBRUGH, J. W.	Hamilton	1876
ROSS, GEO.	Montreal	1868
ROSS, J. G.	St. Anne de la Pérade, Q.	1868
ROSS, JAMES	Toronto	1867
ROTTOT, J. P.	Montreal	1867
ROUSSEAU, E.	Quebec	1867
ROUSSEAU, J. O.	Nicolet, Q.	1867
ROUSSEAU, T. L.	St. Casimer, Q.	1867
ROY, F. E.	Quebec	1867
ROY, G. E.	Boucherville, Q.	1867
ROY, L.	Quebec	1867
ROY, S.	St Jean Port Joli, Q.	1867
ROY, T. G.	St. Joseph Louis, Q.	1867
RUGG, H. C.	Compton, Q.	1868
RUSSELL, J. P.	Toronto	1869
RUSSELL, R. H.	Quebec	1867
RYAN	Sussex	1875
SAMPSON, C. G.	Quebec	1868
SANFORD	Hants	1875
SAUVE	Buckingham	1872
SCHMIDT, S. B.	Montreal	1868
SCHULTZ	Winnipeg	1870
SCOTT, W. E.	Montreal	1867
SCOTT, WILLIAM	Woodstock, O.	1874
SELLY, J. B.	Chambly, Q.	1868
SEWELL, COLIN	Quebec	1868
SEWELL, J. A.	Quebec	1867
SEYMOUR	St. John	1873
SHEFFIELD, M.	St. John	1873
SHEPHERD, F. W.	Montreal	1876
SHERRIFF, F. W.	Huntingdon, Q.	1868
SIMARD, L. G. A.	Quebec	1867

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SIMPSON, J. L.	Uton Junction	1873
SINCLAIR, C. A.	Martintown, Q.	1868
SIROIS, D. F. A.	St. Paschal, Q.	1867
SMITH	Wickham	1873
SMITH, E. D.	Digby, N.S.	1867
SMITH, J. W.	St. John	1873
SMITH, THOMAS	Mitchel, O.	1869
STANSFIELD, J.	Lorette, Q.	1867
STEVERMANN, J.	Lunenburg, N.S.	1867
STEVES, J. T.	St. John, N.B.	1868
STEWART, A.	Mono Mills, O.	1869
STEWART, R.	Belleville, O.	1868
STRANGE. O. S.	Kingston, O.	1867
STRANGE, F. W.	Toronto	1869
SULLIVAN, M.	Kingston, O.	1868
SWEETLAND, J.	Ottawa	1870
TACHÉ, C.	Ottawa	1868
TASCHEREAU, J. A.	Levis, Q.	1867
TASSÉ, J. R.	Montreal	1867
TEMPLE, I. A.	Toronto	1869
TETU, L.	Rivière Ouelle, Q.	1867
THAYER, L. O.	Montreal	1877
THERIEN, H.	Yamaska, Q.	1867
THOMPSON, R.	Montreal	1868
THOMPSON, R. C.	St. Stephens	1873
THORBURN, JAMES	Toronto	1867
TRAVERS, B.	Buffalo, N.Y.	1873
TRENHOLME, E. H.	Montreal	1868
TRESTLER, C. F. F.	Montreal	1868
TRUDEL, E. H.	Montreal	1868
TUPPER, HON. CHARLES, C.B.	Toronto	1867
TURCOT, T.	Montreal	1867
TURCOT, M.	St. Hyacinthe, Q.	1867
TURGEON, L. G.	Montreal	1869
TURQUAND, J.	Woodstock, O.	1874
TYE, G. A.	Thamesville, O.	1876
VAIL, E. J.	Sussex Vale	1873
VALADE, F.	Ottawa, O.	1867
VALENTINE, J.	Toronto	1869
VANDERHEYDEN, A.	Levis, Q.	1867
VAUX, H. E.	Brockville, O.	1870
VERGE, C.	Quebec	1867
VERCOE, H. L.	Egmondville, O.	1869
VOLIGNY, L. L.	St. Elizabeth, Q.	1867
WADDELL, J.	St. John	1873
WAKEHAM, W.	Leeds, Megantic, Q.	1867
WALKER, T.	St. John	1873
WALSH, T.	Halifax	1875
WARD, A. B.	Montreal	1877
WHEELER, T. B.	Montreal	1868

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WHERRY, J. L	Quebec	1867
WHITE, J. D	Carleton, O	1873
WICKWIRE, W. N	Halifax	1868
WILKINS, GEO	Montreal	1876
WILSON, J. H	St. Thomas, O	1873
WOODILL, A. H	Halifax	1875
WORKMAN, B	Uxbridge, O	1869
WORKMAN, J	Toronto	1869
WORTHINGTON, E. D	Sherbrooke, Q	1867
WRIGHT, F	Toronto	1876
WRIGHT, GEO	Toronto	1869
WRIGHT, H	Ottawa	1874
WRIGHT, H. H	Toronto	1867
YEOMANS, H. R	Mount Forest, O	1876
ZIMMERMAN, R	Toronto	1875

The Secretary fears that the foregoing is an incomplete list of the permanent members. He begs to express his regrets and apologies to any whose names may be omitted, and to request them to send their names to him with initials, residence, and date of membership.

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